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THE TREATMENT OF PILONIDAL SINUS IN HOSPITAL PRACTICE*

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BOSTON

THE lesion commonly known as pilonidal sinus offers to the embryologist an interesting subject for speculation, but to the surgeon it presents essentially the problem of making a wound heal in a place where it does not want to heal. The suggestions for curing this troublesome lesion are many and ingenious, but as elsewhere in medicine the very multiplicity of remedies is evidence that not one is entirely satisfactory.

Patients will be cured and will fail to be cured by all the methods of treatment described in the literature, and some of the cures will be brilliant and some of the failures will be most distressing. The average surgeon who is called upon to treat an occasional case finds it difficult to evaluate the usefulness of various methods, and is inclined to stick to the one with which he is familiar. The same is true in hospital practice where the changing personnel of the resident staff permits of no evaluation of methods, so that the same traditional method is likely to be passed along for years regardless of the end result.

At the Massachusetts General Hospital our failures have been reduced from about 30 per cent to the neighborhood of 3 per cent since 1932, when a special study of this disease was undertaken, and it is now believed that an account of our experience may be of sufficient interest to warrant a brief presentation.

Prior to 1932, all cases of pilonidal sinus were operated on in the hospital, and followed in the Out Patient Department, so that some of our poor results could be ascribed to the division of responsibility between the surgeon who did the operation and the various surgeons who carried out the aftercare. We have now simplified the operation to the status of an outpatient procedure and have largely eliminated this division of responsibility.

In 1932 an analysis and follow-up of the cases of 119 patients treated during the eight preceding years showed that 30 per cent had not been cured of their disease.[1] These patients had all been operated on under general or spinal anesthesia. In most cases an attempt had been made to outline the extent of the sinus by the injection of methylene blue into the main opening. Radical excision had then been done of a block of skin and fat large enough to ensure the removal of all diseased tissue. Frequently the coccyx and sacral periosteum had been removed when found stained by dye. The wounds were often very large. Some of the wounds had been closed, with or without drainage, by undercutting, by plastic flaps and by deep stay sutures in an effort to eliminate dead space. The rest had been packed wide open with gauze. The average postoperative hospital stay had been eleven days. In the cases which were cured the average time of wound healing had been about three months and many of the resultant scars were large, unsightly and uncomfortable.

On the basis of this investigation it was apparent that many of our difficulties were directly related to the large size of the wounds. We are now convinced that except in rare cases such large wounds are entirely unnecessary, and that the morphological conception on which they were based is fallacious.

In order to reach this conclusion it was necessary to undertake a pathological study of a number of surgical specimens from representative cases. Therefore, between 1932 and 1934, 72 additional radical excisions were done, primarily with the purpose of securing pathologic material for study, but also for the opportunity of making careful clinical observations on a controlled series of cases. About half the operations were done by me personally, and the rest were performed under my close supervision, but in spite of scrupulous attention to the choice of procedure and details of technic our results were not

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improved in any respect over those of previous years.

Meanwhile a painstaking examination of the surgical specimens was being carried out by Dr. Marshall G. Hall of the Pathological Department, and his study revealed four facts of the greatest practical importance.[2]

First, with regard to morphology, over 70 per cent of the sinus tracts were simple midline structures which could have been included in a piece of tissue 2 by 2 by 5 cm.

Second, the coloring matter which had been injected during life, and which was interpreted at operation as indicating fine ramifications of the sinus tract, was seen on microscopic examination to be filling lymphatic trunks in perfectly normal tissues.

Third, infection was found to be present in every case, and the only changes seen to have taken place were those caused by infection. There was no evidence that the epithelial rests constituting the original congenital defect had any tendency to extend except as they were forcibly displaced by abscess and scar-tissue formation.

Fourth, the almost universal belief that recurrent sinuses after surgical excision were always due to incomplete removal of epithelial tissue was disproved by demonstrating its absence in a number of specimens from recurrent cases. Furthermore, the cause of these recurrences was shown to have been infected dead space and nothing else.

All these findings led to the conclusion that large radical excisions are unnecessary and that the problem is chiefly one of wound healing in the presence of infection. It remained to apply these ideas to the actual treatment of patients. In 1935 we began the conservative excision of pilonidal sinuses in the Out Patient Department.[3] The tissues were locally infiltrated with novocain containing adrenalin, and the sinus tract and hair nest were dissected out through a midline skin incision in a nearly bloodless field by means of a small cautery blade. The resultant narrow wound was then packed with gauze, and the patient was allowed to go home. In most cases this proved to be a minor procedure requiring from twenty to thirty minutes and causing the patient no more reaction than does the excision of a wen. Several patients returned to their work or attended a ball game or a dance on the day of operation. We soon discovered, however, as was to be expected, that the occasional patient with a lesion complicated by extensive scarring was best managed in the hospital under a general anesthetic. Of the 150 cautery excisions done between 1935 and 1937, 14 were done in the hospital and 136 in the Out Patient Department.

All the wounds were left open because we believed them all to be infected, and because the natural way for infected wounds to heal is by second intention. The patients returned Mondays and Thursdays to have their dressings done by the surgeon who operated on them, and each surgeon exerted himself to have his patients heal the fastest of any. The shortest healing time in this series was five weeks, but more recently it has been reduced to four weeks. Except for certain cases of definitely delayed healing, the average time was about nine weeks. The wounds healed to a soft, inconspicuous linear scar.

The fact that 97 per cent of these patients were cured by a conservative excision and have stayed cured for one to four years convinces me that large block excisions of tissue carried out under the deceptive guidance of injected coloring matter are neither necessary nor desirable. This belief is apparently gaining ground, at least locally, since 70 additional cautery excisions have been done at the Massachusetts General Hospital in the past year and a half by the resident staff and by seventeen different members of the visiting staff, as compared with only 8 radical block excisions.

The establishment of this principle simplifies the treatment of pilonidal sinus, but it falls far short of solving its problems. There will always be a small proportion of troublesome cases which will be hard to cure by any method. All pilonidal sinuses have something in common: they originate in the midline and are infected, but beyond that they may show every variation from the simplest to the most complex. Therefore we must recognize that they cannot all be treated alike. Our experience has been that in hospital practice the procedure of conservative cautery excision and healing by second intention comes within the reach of more patients and gives better results than any other method we have tried, and if a single method of treatment must be adopted as a routine, this is probably the best one at the present time.

Although this paper is primarily concerned with the treatment of hospital patients it applies, with certain modifications, to private patients as well. I have done a number of cautery excisions in my office without encountering trouble, but because of the uncertainty of knowing in advance just how extensive the excision may need to be, I prefer to do such excisions in the hospital. The situation is a little different in an outpatient department, where a patient may be kept overnight in the emergency ward if it seems desirable. Furthermore, most private patients themselves prefer to be in the hospital where they can be waited on for a day or two afterward. And there is

nothing to be gained by avoiding hospitalization, since the question of divided responsibility does not arise.

Perhaps the most important reason for hospitalizing the private patient, however, is the chance it gives for varying the operative procedure in accordance with the actual findings. The use of the cautery is not essential in doing a successful conservative excision; it simply facilitates it by providing an almost bloodless field. The same thing can be done by careful sharp dissection and the use of a little more adrenalin in the novocain; and if the defect is small and not too badly infected to interfere with primary healing, it may be sutured by some one of the technics described in the recent literature, with a reasonable chance of cure.

Conclusion

A six years' experience in the treatment of pilonidal sinus at the Massachusetts General Hospital has convinced me that most failures are not due to incomplete excision of diseased tissue but to faulty wound healing caused by infection and retained dead space; that there is no practical or theoretical justification for the radical excision of large blocks of normal skin and subcutaneous tissue; and that in unselected cases the highest percentage of cures can be obtained by conservative excision of the sinus tract and hair nest under direct vision, followed by solid second-intention healing of the open wound, with the patient ambulatory and under the care of the same surgeon from first to last.

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Discussion

Dr. Walford T. Rees, Burlington, Vermont: Dr. Rogers has given us all something to think about. I have had no experience with the use of cautery excision of pilonidal sinus. I have had some little experience with other methods of treatment and most of it has been rather disappointing. I looked up our records at the Mary Fletcher Hospital during the past ten years. There were 35 cases of pilonidal sinus which had been taken care of by several operators. I attempted to follow up the records of these cases, but was unsuccessful except for my own cases, which numbered 15. Thirteen were operated on by block dissection and some method of flap repair. There were 5 recurrences among the 13 cases, or 38 per cent, which is, of course, too much. Two cases operated on by block excision and then packed wide open had no recurrence.

Now, if Dr. Rogers, by his method, can show us only 3 per cent recurrences, it is probably the method for all of us to use. He says that it should be done by one surgeon familiar with the operation, and my experience, particularly with the aftercare, leads me to subscribe to that.

I agree heartily with Dr. Rogers that most of our recurrences are due not to the fact that some sinus was left at the time of the original operation, but to neglect in the care of the wound. This is very important, because, I believe, this condition happens most frequently in hairy individuals, and if at the time of dressing we are not careful to shave the surrounding skin and prevent the edges of the wound from invaginating, we shall get recurrences.

The flap operation in certain cases has a great deal to recommend it. If you can send a patient into the hospital, remove a sinus and do a flap operation, covering over the lower end of the sacrum, the patient can be discharged from the hospital in from five to seven days, and if there is no infection the patient does not have to have dressings for six to nine months. This method has a great deal to recommend it, and I am sure that the patient who receives this type of operation likes it better than having to have dressings for a long time. Unfortunately, we get a high percentage of recurrences.

Possibly, early cases of pilonidal sinus which have not been the seat of frequent infections, abscess formation, and accessory sinuses may still be treated by the flap method. Probably in the majority of cases that have had frequent bouts of infection, multiple sinus formations are best treated by excision, either by the cautery as described by Dr. Rogers or by wide-open packing with careful, frequent dressings.

Dr. Carl H. Stevens, Belfast, Maine: In reviewing the literature, I find that several methods of treatment for this relatively rare condition have been advocated. The sclerosing method seems to have been discarded. Excision with primary union seems to be indicated in uninfected cases, but as most of the cases when seen are already infected, to attempt to obtain primary union seems rather unwise. Therefore the method most highly favored is excision, and wide excision.

Until Dr. Rogers developed his method, it seems that excision by the knife, using a wide, elliptical incision down to the fascia, was the method of choice, but I think that he has shown definitely that the use of the electric cautery has a distinct advantage, as it reduces both the time required to obtain a permanent cure and the rate of recurrence.

Dr. Frank H. Lahey, Boston: Inasmuch as we have published a method of treating these cases radically, it becomes my duty to say that since Dr. Rogers has developed this method we have treated almost none by the radical method. His method is the one we have taken up and applied, and we have had just the same degree of satisfaction that he has had. I think it is a real advance.

Dr. Daniel C. Patterson, Bridgeport, Connecticut: We have all had the experience with pilonidal sinuses of trying various methods to close them and to get primary union, but with infrequent success. We have excised the sinuses and packed the cavity with gauze. This method of healing by granulation has given good results, but entails a long period of dressing which is not very pleasant.

Dr. Rogers's procedure is without doubt the best universal method to be carried out when the operations are done in the outpatient department or by the resident staff, and also in badly infected cases; however, there are some cases, I am sure, in which clean, early healing can be secured and the patient saved the inconvenience of months of dressing. Doubtless every surgeon has treated cases in which he had suspected that the sinus could probably be closed.

In such cases I have of late tried the following procedure, and in the few so far operated on have had most satisfactory results. The sinus and cyst are injected without force with a weak solution of methylene blue, and excised, care being taken not to remove too big an area of normal skin; bleeding is controlled and the cavity is closed up to the skin with fine chromic gut. No sutures are placed through the skin. I have assumed that if suppuration did occur it would work toward the surface, and not meeting the resistance of a skin-sutured wound would cause but little trouble.

Whether or not the patients so treated will have trouble later on is of course yet to be discovered. I think that the procedure is worth trying in many cases, as the technic is so simple.

Dr. Peter P. Chase, Providence, Rhode Island: In July, 1938, I operated on a big, fat girl with pilonidal sinus, and the wound apparently healed at once. In May of this year I was much distressed to find a large abscess. I had to open it and found a cup or two of pus. The patient went away for the summer, but this fall she said that she still had a weeping sinus. Can I go ahead with the cautery and do as Dr. Rogers has said and expect to get a perfect result?

Dr. Philemon E. Truesdale, Fall River, Massachusetts: Dr. Lahey is always about two laps ahead of me, but I still stick to the radical operation because I think it does remove all the sinuses, and you only have to operate once.

Dr. John Homans, Boston: In operating on this condition, I split the sinus and remove it with a heated instrument, but I believe it is possible to close the deeper part of the wound and leave the top part open, probably with less delay in healing.

Dr. Rogers (closing): Dr. Rees perhaps misunderstood me as meaning that only one surgeon should ever operate on pilonidal sinuses, and that it should become a specialty. I meant that each patient with a pilonidal sinus should be under the care of the same surgeon until cured. It was only for this reason that we believed it necessary to make the entire management an outpatient procedure.

Dr. Stevens referred to the rarity of the disease. I think that it is for that reason that so many men who know far more about more important lesions are unable to evaluate the different methods which are described for managing this one.

As to lateral extensions, if the sinus opening is more than 3 cm. from the midline, a right-angle skin incision must be made out to it and 0.5 cm. beyond it. If it is closer to the midline, it is a simple matter to undercut the skin to beyond the extreme lateral extent of the abscess wall.

Dr. Patterson spoke of partial closure. We have had experience with partial closure of different kinds, and have abandoned it because we believe that the recurrence or failure is due essentially to what may be called a soft-tissue sequestrum hidden in the wound. The type of abscess that Dr. Patterson mentioned is commonly seen after partial or complete primary closures in which, owing to dead space, second-intention healing is allowed to take place out of sight. I have watched cases of that sort in an open wound and have seen a place where the blood supply was apparently inadequate to support normal granulation tissue become farther and farther depressed below the level of the actively growing granulation, and finally have seen the active granulation close in over it and make a little vacuole with chronically infected granulation-tissue walls. The wound then continued to heal up to the top, and the scar healed across it, hiding the infected dead space from sight. Weeks or months later the abscess came and the recurrent sinus developed. Such a sequence can be prevented in an open wound. In a closed or semiclosed wound it accounts for many failures.

The recurrent case of Dr. Chase can be operated on by this technic exactly as the primary case can be, but in the presence of extensive scar tissue it is impossible to get adequate anesthesia with novocain, and a general anesthetic has to be used.

If our experience had been the same as Dr. Truesdale's, namely that only one operation is necessary provided it is radical enough, I should perhaps favor doing the radical operation. But I have not found that to be true. Our failures following radical excision amounted to 18 per cent even when the wounds were packed wide open. Disregarding the way the wounds were handled, radical excision resulted in failure for 50 of the 140 patients in our earlier series.

In closing, I do not mean to leave the impression that cautery excision is the only way in which pilonidal sinuses can be cured. By a proper selection of cases, some of them can be excised cleanly enough and closed right off by some of the methods described, with a fair expectation of cure. I do not believe that this can be successfully done in a general hospital clinic, and I suspect that any surgeon who attempts it in private practice is risking the loss of more than he stands to gain if successful. If he succeeds, he is excused from a number of dressings and the scar will not be any better, but if he fails, he has the whole thing to do over again and possibly more than once. Nevertheless, and subject to those limitations, I think that there is a place for some of the various methods that have been described for primary closure of these wounds.

PRESIDENT'S ADDRESS*

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MANCHESTER, NEW HAMPSHIRE

DURING the past year, I have had the honor of serving this society as its one hundred and forty-seventh president. The task has not been too arduous, and I feel more than recompensed for the effort I have expended. The visits to the several county societies have been especially pleasant. Here I have had the opportunity not only to meet many old friends, but also to get acquainted with many physicians whom I had not previously known, and have been privileged to listen to their scientific papers and to enter into their discussions. I never come away from one of these meetings without a deeper appreciation of the value of the work being done by the members of our society, and I especially urge all members to attend these meetings each spring and fall. In these small groups—component parts of the New Hampshire Medical Society—one and all may express their views, ask questions or discuss any topic that may interest them, with less formality than in a large meeting such as that we are attending today.

In two years, the New Hampshire Medical Society will celebrate its one hundred and fiftieth anniversary, and at that time I hope the officers and committees will make every effort to have this a gala occasion.

Many changes in the practice of the healing art have taken place since the Society was founded. Advances have constantly been made in all its branches. New instruments and apparatus have been developed to make diagnoses more exact. New drugs, surgical procedures and other forms of therapy have made possible more rapid and successful recoveries. During this time of phenomenal scientific advancement, we have been prone to ignore the social and economic side of the practice of medicine, and we are now confronted with what we regard as a radical change in, and a challenge to, our rights as practicing physicians. For years the State has increasingly assumed the care and treatment of various diseases and conditions which were formerly the problems of the individual physician. All doctors will agree that there are certain conditions affecting the public welfare which can be treated more effectively as a state project. Especially is this true of certain mental conditions, of the control and prevention of contagious diseases, of the infirmities which may eventually make the individual a public charge, of sanitation and of any condition affecting the public health. All these have necessitated the formation of many agencies, the establishment of a number of institutions and the expenditure of large sums of money for their maintenance. This has actually put the State into the practice of medicine. While all this has no doubt been necessary and inevitable, I, for one, did not appreciate the magnitude of the work or understand the functions of the several agencies until, as your president, I visited the institutions and talked to the heads of the many departments. As it will probably be impossible for each one of you to become familiar with these organizations and to visit the institutions, perhaps my impressions and findings will be of value to you.

THE STATE HOSPITAL

The largest of our institutions is the New Hampshire State Hospital at Concord, which opened its doors in October, 1842, with facilities for 96 patients. Today there are fifteen buildings with a total of forty-eight wards, the maximum desirable capacity of which is 1565, but there are actually 2219 patients, or, an overload of more than 600. The greatest appreciable increase was between the years 1903 and 1914, during which period the mentally ill patients who were being cared for at the different county institutions were transferred to the State Hospital. However, this increase in population has continued at about the same rate to the present date, owing to a number of causes. There was a time when these patients could be cared for in their homes or in private institutions, but economic conditions have necessitated their depending more and more on the State. Another contributing factor is that the general public has become hospital-conscious, and realizes that the hospital is a place for the treatment and cure of the mentally ill rather than just a place of retention for these unfortunates; so today it is the exception rather than the rule that these patients are treated at home. The New Hampshire State Hospital Survey of 1938, made by the State Planning and Development Commission, states that the hospital has two functions: to cure and improve the mental illnesses of the State's citizens, and to act as a place

*An address read at the annual meeting of the New Hampshire Medical Society, Manchester, June 9, 1939.

†President, New Hampshire Medical Society.

of custody for those citizens who cannot be cured or improved.

Keeping pace with this increase in hospital population has been a corresponding increase in the efficacy of the management and treatment. The hospital has a very efficient staff of specialists who employ all the modern equipment and therapeutic procedures. The death rate has decreased from 115 per 1000 in 1919 to about 60 in 1938.

The largest number of admissions are by certification of physicians, but there are also many voluntary ones, and some by court order. We are very fortunate in New Hampshire in being able to commit a patient on the certification of two physicians, whereas in some states an order of the court is required. This permits the earlier treatment which is essential in many cases to effect a cure. In making out certificates of commitment, physicians should give as clear a picture of the case as possible, fully answering all questions on the blank, and seeing that it is properly signed and sworn to, before sending a patient to the hospital. I am informed that in the past much inconvenience and considerable delay have been caused by the incompleteness of these legal forms.

I was considerably impressed by the manner in which the newly admitted cases are handled. They are placed in the admission ward, when possible, where they are studied by the staff, and after frequent consultations are placed in suitable surroundings and given the care required for their individual conditions. The staff is always willing to have, and welcomes, conferences and discussions with the committing physicians.

It can readily be seen that the present institution is much overcrowded and that additional facilities are needed to care for the overload. It has been recommended by the superintendent, Dr. Charles Dolloff, that there be some new construction at Concord and that the farm at this site be discontinued and a new farm procured at some place not more than thirty miles distant, with sufficient buildings and facilities to care for any surplus which may develop in the future.

The hospital also has other needs than that of additional room for patients. Much should be done in the prevention of mental diseases. For the last five years, through the work in the mental-hygiene clinics, a number of children have been found requiring hospitalization under psychiatric supervision. Unfortunately no hospital in the State has facilities for the care of these cases, and such a unit established at the State Hospital as a therapeutic and diagnostic center would serve an excellent purpose.

Epilepsy continues to be one of our problems. At present these patients, if in the State Hospital, are placed on the same ward with psychotic patients. A separate unit, where they could be individually treated, would be a useful step forward.

Many patients seen in the venereal clinics suffer from neurosyphilis and would benefit from more expert therapy for this condition, including fever therapy. Unfortunately the early cases showing no mental symptoms are at a disadvantage because the patients are unable to receive treatment at the State Hospital until they are actually considered insane. It is hoped that some arrangement can be made whereby all indigent patients with neurosyphilis can receive additional treatment at the State Hospital in the early stages, when they would benefit from it most.

The extramural activities of the hospital deserve high praise and support. Clinics are now held by members of the staff in Concord, Manchester, Nashua, Dover and Portsmouth. This gives the local physicians the benefit of expert advice on their problems, and it is to be hoped that a large number of physicians will take advantage of this opportunity.

The State School

Although all physicians have long recognized that there is a difference between insanity and feeble-mindedness, no special provision was made for the care of the latter until 1903, such cases having been cared for in the county institutions and the State Hospital. Strange as it may seem, the Laconia State School was definitely instituted by a petition to the legislature from the women's clubs of the State of New Hampshire. The act creating the school was passed in May, 1901, and the school was formally opened in February, 1903. During the first year there were admitted 71 persons, all that the institution was capable of caring for at that time. The original group of farm buildings, still in use, has been added to and improved. In addition, a number of new buildings have been constructed, including dormitories, a grammar school, a service building and a new, fireproof infirmary with facilities for the care of an accumulating number of infirm and bedridden children. The infirmary also contains a laboratory, rooms for dentistry and for clinical examinations, an operating room for minor surgery and drug storage space. The present census is 621 persons; of these 436 are helpful, to a lesser or greater extent, and can do some kind of work, either in the buildings or on the farm. Also under the jurisdiction of the school are 92 persons on parole.

In the grammar school there are 150 boys and girls under specially trained teachers. Academic

instruction is seldom carried beyond the age of seventeen, but in the arts and crafts and manual-training departments some of the older pupils carry on further educational training. The results obtained through the untiring efforts and patience of the superintendent and his staff with these handicapped individuals are very impressive. This is especially marked in the Manual Arts Department.

Here are more than 600 unfortunates in an institution, and probably as many more throughout the State, although no census has ever been taken and no provision made for reporting this condition. This makes one wonder whether many of the conditions with which the patients are afflicted could not have been prevented or alleviated. We as physicians recognize that mental deficiency has as a basis brain lesions of an anatomical, chemical, electrical or physiological nature, either of the immediate past or perhaps remote and due to ancestral disease. This gives us a clue to some probable preventive measures, such as the better practice of obstetrics in order to prevent cerebral hemorrhage or other brain injuries, the premarital blood-test law recently enacted, which should do much to obviate congenital syphilis, and the sterilization law. A paper by Baker,[1] contains the following statement:

> The legal sterilizing process in New Hampshire requires forty-four days of legal procedure before an operation can be done. It requires the appointment of a guardian for the occasion by the probate court whenever a competent natural guardian is wanting; complete fourteen days' service of notice and a hearing before the trustees or commissioners. This law has three outstanding requirements:
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> 1. Legal sterilizing operations can be done only on inmates of state and county institutions.
> 2. The person subject to a legal sterilizing operation must be insane, feeble-minded or epileptic.
> 3. In the words of the law, the person must be found to be "a probable, potential parent of socially inadequate offspring likewise afflicted."

These measures, together with the newer methods of placing and treating babies and young children, will no doubt do much to lessen the number of these cases in the future.

Sanatoriums

Throughout the years, physicians have led the way and pleaded for adequate sanatorium treatment for tuberculous patients in New Hampshire. None know better than they that the cost of treating this disease is high — far beyond the means of the average family — and that a considerable period of time is required in order to effect a cure. We have two sanatoriums in New Hampshire — one state-owned and operated, at Glencliff, and the other private, at Pembroke.

The Glencliff Sanatorium is 1650 feet above sea level, the legislative act having required that the institution be established at not less than this altitude, since many specialists at that time believed that high altitude had a favorable tendency toward the cure of the disease. The institution originally consisted of an administration building and two cottage wards for patients. Both these wards were open to the south, as fresh air was also considered of great importance in the cure of the disease. Thirty beds were available for patients.

Since the opening of the Glencliff Sanatorium in 1909, the growth and development of the establishment have been phenomenal. At the present time it is rated as one of the leading institutions of its kind in the country. Additions to the cottage wards have been made, so that the excessive amount of fresh air has been mitigated, as is especially necessary in the extreme cold of a New Hampshire winter in the "North Country." An infirmary building with individual rooms for patients, more in keeping with modern methods of treatment of the disease, was added in 1935, and several years ago an addition increased the capacity of the building to approximately 90 beds. A heating plant, tunnels between the buildings, lighting of the roads, grading of the grounds, the addition of a recreation building and other improvements have greatly aided in making Glencliff meet the requirements of a modern sanatorium.

The infirmary building contains an excellent operating room, and facilities for pneumothorax and some other forms of chest surgery, such as pneumolysis and phrenicectomy. The more serious operations in chest surgery, such as thoracoplasty, are performed at the New England Deaconess Hospital in Boston by Dr. Richard H. Overholt, or at the Mary Hitchcock Memorial Hospital at Hanover, New Hampshire, by Dr. Dawson Tyson.

The sanatorium at Glencliff has approximately 140 beds at the present time. The policy of the institution is to restrict admissions to a class of cases designated as "favorable," such as first-stage and second-stage patients not carrying persistent temperatures, and cases without complications.

Application for admission to the New Hampshire State Sanatorium is made to Dr. Robert M. Deming. Any physician may write or telephone for an application blank. On receipt of the application Dr. Deming may request an x-ray film of the patient's chest. After study of the facts rela-

tive to the stage of the disease, and the prognosis, the superintendent may accept the case. If rejected because of an unfavorable outlook, the case is referred to the State Board of Public Welfare for admission to the Pembroke Sanatorium.

In 1911, recognizing the principle that advanced cases should be treated in institutions readily accessible to relatives and friends, the State of New Hampshire inaugurated the policy of providing a subsidizing appropriation for the treatment of advanced cases of tuberculosis and for the encouragement of the establishment of institutions for their care. Under this appropriation, only the cost of maintenance of beds is provided, and the advanced-case work has been carried on at the Pembroke Sanatorium.

This institution, one of the oldest sanatoriums in the country, established in 1900, is located at an elevation of 650 feet — high on the crest of the Pembroke hills — in the town of Pembroke. Being thirteen miles north of Manchester and five miles south of Concord, it is near the center of population of nearly 75 per cent of the State.

Consisting in the early days of an administration building and three camps for approximately 20 patients, the institution has now grown to a 100-bed capacity. With the beginning of the state work, the camp idea has been gradually abandoned and frequent additions have been made to the administration building. The facilities now available provide hospital rooms for each patient. All the buildings are protected against fire by a sprinkler system and other devices. All modern facilities for diagnosis and treatment are now available, with an x-ray department and an operating room for pneumothorax, pneumolysis and similar operations. As is the procedure at Glencliff, thoracoplasty cases are sent to the New England Deaconess Hospital or the Mary Hitchcock Memorial Hospital.

The State's work for tuberculous children has been developed at the Pembroke Sanatorium. Excellent facilities are available for boys and girls. A school is maintained on the sanatorium grounds, and the curriculum and program are carried out in accordance with the requirements of the State Board of Education.

All the patients at the two sanatoriums are state beneficiaries, some paying part of the cost of treatment. The State Department of Public Welfare passes on the admissibility of patients as state beneficiaries, the State assuming entire or partial expense as the financial status of the patient and his family warrants. For the most part, patients are given full state aid.

Many physicians refer their patients to the clinics now so advantageously located throughout the State and maintained under the auspices of the New Hampshire Tuberculosis Association. These clinics assume the responsibility of making an application for admission of patients to Glencliff or Pembroke, as the findings warrant.

The efficacy of the treatment of tuberculosis in the State of New Hampshire can be readily seen by comparing the death rate of 150 per 100,000 in 1900 with that of 38 in 1935. This was the lowest of any of the New England states and about 20 units lower than the country as a whole. This good showing can be bettered by an increased effort to detect the disease in childhood, which can be accomplished by skin tests, x-ray photography and careful physical examinations.

State Board of Health

Probably the most far-reaching of any of our public-health organizations is our State Board of Health. This is composed of six members. The governor and attorney general are ex-officio members, and in addition the law provides that there shall be three physicians and one civil engineer, two of the latter four appointed biennially by the governor, with the advice and consent of his council, to serve for terms of four years. The last legislature added one more lay member. The administrative head is a physician trained in public-health work, who acts as secretary, and is also, by law, the registrar of vital statistics and the state pathologist. Under him function the following departments:

Department of Vital Statistics. This office does the tabulating, recording and preserving of all vital-statistics material. This work has been greatly increased since the passing of the Social Security Act. In 1934, there were only 1432 inquiries, as compared with 3025 in 1938.

Department of Venereal Disease Control. This department operates six clinics, situated in Manchester, Dover, Nashua, Portsmouth, Concord and Berlin. These clinics care for patients who are financially unable to be treated by private physicians. The division supplies private physicians with medication for the treatment of syphilis. During 1938 there were distributed 9201 doses of arsenicals and 9441 doses of bismuth.

Division of Maternal and Child Health. The director of the division is a physician. Its activities are as follows: the organization and maintenance of child-health conferences, where approximately 500 babies are seen each year; the maintenance of three prenatal clinics, serving about 1200 mothers; the distribution of educational literature; the employment of a full-time nutritionist, who gives advice to other state depart-

ments, local relief agencies, nursing organizations and lay groups. The director carries on an annual study of maternal deaths and stillbirths, trying to determine their cause and the means of reducing them. This is done in conjunction with the New Hampshire Medical Society, and the director acts as the go-between for the Society and the doctors. Through this co-operation it is hoped that there will be a better practice of obstetrics. The division also licenses all maternity hospitals and homes, of which there are about 150 in the state.

Division of Crippled Children's Services. This division provides for the registration, hospital care, furnishing of appliances and aftercare services — including nursing and physiotherapy — to crippled children under the age of twenty-one. It also supervises clinics in Manchester, Nashua, Concord, Keene, Peterborough, Laconia and Littleton. Approximately 350 crippled children are aided during the year.

Division of Epidemiology. This division has charge of the communicable-disease-control work of the Board of Health. An exception is made in the tuberculosis work, which is carried on mainly by Dr. Robert B. Kerr, under the direction of the New Hampshire Tuberculosis Association. Dr. Kerr co-operates closely with the State Board of Health.

Division of Chemistry and Sanitation. The chief activity of this department is supervision of the food and drug supply and general sanitary conditions of the entire State. The division consists of a director, a staff of chemists and a bacteriologist who perform the laboratory analyses, and a staff of sanitary engineers and sanitarians who carry on the field work in sanitation. The duties of the laboratory include the chemical and bacteriological examination of drinking water and the analysis of milk, foods, drugs, cosmetics, liquor and such other materials as may affect the public health. The field work consists of supervision and control of public water and sewage systems and of milk supplies, including dairies and pasteurization plants. Regular inspections are made of grocery stores, drugstores, restaurants, hotels, overnight camps, tourist places, juvenile camps, lumber camps and many other establishments which serve food and offer lodging to the public. It also has licensing and regulatory control over many of these activities. The industrial hygiene unit of this division is prepared to give technical service and advice to industrial plants in the control and prevention of occupational diseases.

Division of Public-Health Nursing. This department employs thirteen regular public-health nurses doing full-time work, three substitutes and nine WPA nurses. It co-operates with all divisions of the Board of Health where nursing services are required.

Division of Bacteriology, Serology and Pathology. It is probably with this division that physicians are best acquainted, and I am sure that we all appreciate the co-operation and help which it gives us. The main laboratory is situated in the State House in Concord, and a branch is maintained at the Dartmouth Medical School at Hanover. Both are equipped and staffed to perform all standard bacteriological and serological procedures, and the laboratory at Hanover does the pathological work for the department. Since the blood-test law has been in operation there has been a tremendous increase in the volume of serological work. The department is always ready to inaugurate new procedures that will be of service to the physician. Appreciating the value of serum treatment in certain types of pneumonia, it has added the service of typing sputums and furnishing serum where indicated. In order to obtain the best results, the members of the department ask that physicians take the sputum as early as possible in the course of the disease, give a history of the case and report on the results of the treatment. The laboratory gives twenty-four-hour service in pneumonia typing. This is a distinct advantage, as the efficacy of serum treatment is dependent on early administration.

During the year ended March 31, 1939, a total number of 81,261 tests were carried out. I am sure you will agree that this is a vast amount of work, and it goes to show the confidence that physicians have in the State Laboratory.

Miscellaneous

There are a number of other agencies concerned in public-health work in New Hampshire. Notable among these are the State Board of Education, the Department of Public Welfare, the Cancer Commission and many licensing boards and extension services.

* * *

All these activities, with their ramifications, show the necessity of some means of co-ordinating these independent agencies. Logical suggestions and possibilities have been very clearly outlined in the survey, *The Administration of Public Health in New Hampshire*,[2] published by the New Hampshire Foundation.

The New Hampshire Medical Society represents

the individual physicians, and is always anxious to co-operate in matters pertaining to the public health of the State; but it believes that it should be consulted as to any changes and innovations concerning the practice of medicine, and that its opinions should be given consideration. In this way, any differences could be adjusted before launching a new program, and thus make for better understanding and prevent the unfortunate fate of our fellow physicians in some foreign countries.

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THERAPEUTIC LIMITATIONS OF FEMALE SEX HORMONES IN GYNECOLOGIC CONDITIONS*

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FREQUENTLY I am asked where one can find a clear, easily understandable exposition of the female sex hormones, their origins, actions, indications and dosages. Despite the strides of the last fifteen years, our knowledge of the female sex hormones is still meager. There is no simple, satisfactory exposition of them for the clinician, for the subject is in a state of flux and the fundamentals are barely beginning to crystallize. The bewildering array of names under which hormonal preparations are advertised is an indication that enthusiasm in a newly expanding field has prematurely stimulated commercial exploitation while fundamental knowledge has lagged.

GENERAL CONSIDERATIONS

The female sex hormones comprise the following: gonadotropic extracts from the anterior pituitary lobes of animals, lactogenic extracts from anterior pituitary lobes, gonadotropic extracts from the serum of pregnant mares, gonadotropic extracts from the urine of pregnant women and human placentas, estrogenic substances and progestin.

Anterior pituitary gonadotropic extracts have been found, in experimental animals, to provide a satisfactory substitute for the hypophysis in stimulating ovarian activity. They have not yet, however, been demonstrated to have any value in the conditions of apparent pituitary-ovarian deficiency which confront the clinician. Perhaps they are not sufficiently potent. Perhaps other unknown factors associated with such conditions as amenorrhea or sterility account for their ineffectiveness. Of course the active principle or principles have not been identified or isolated. Furthermore, continued injection of these extracts involves the stimulation of immunity, since they contain foreign proteins. By oral administration they are completely inactive. Anterior lobe gonadotropic preparations may, then, for the time being, be disregarded so far as any practical clinical application is concerned.

Lactogenic extracts are effective experimentally, and there is some evidence that they enhance lactation clinically, but the local soreness from injections of the available impure preparations interdicts their extended use. They are inactive when taken by mouth.

The gonadotropic principle from pregnant mare serum is in hypophysectomized animals a substitute for anterior pituitary extracts, indicating that it is of anterior lobe origin. It can be concentrated to greater potency than can anterior lobe extracts. It has been reported to stimulate the human ovary. Real benefit in cases of amenorrhea and sterility has yet to be demonstrated. Since this principle is derived from horse serum, the possibility of anaphylaxis must be ruled out, or prepared for before injections are undertaken. It is inactive when given orally. That its clinical usefulness remains to be proved is, I believe, a fair statement.

Gonadotropic extracts from the urine of pregnant women and from human placentas contain a substance which stimulates the ovaries of small experimental animals but fails as a substitute for anterior lobe extracts in hypophysectomized animals, thus indicating that it is not of pituitary origin. As a matter of fact, it has been shown to be a product of chorionic cells and is demonstrable in all conditions in which such cells are present in sufficient numbers and functioning, namely throughout human pregnancy, in ec-

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topic gestation, in cases of hydatid mole and in cases of chorionepithelioma, both in men and in women. It is the material which gives the positive tests for pregnancy. Although commonly referred to as anterior pituitary-like substance, or A.P.L., its proper appellation is chorionic gonadotropin. It is inactive on oral administration, and can be given safely only by the intramuscular route.

The functions of chorionic gonadotropin in human pregnancy are not clearly known, but its rapid appearance in the blood and urine following implantation of the ovum is assumed to result in the inhibition of menstruation, either directly or through stimulation of the corpus luteum of pregnancy. Because it is a potent stimulator of corpora lutea experimentally, and because its appearance coincides with failure to menstruate and with the development and persistence of the corpus luteum of pregnancy, we naturally believe that it ought to have therapeutic value in stopping functional flowing and in stimulating luteinization. Presumably in sufficient dosage it would accomplish both these aims, but the material has not been chemically identified and the available preparations are neither pure nor really potent. There is at present no proof that these preparations, in the amounts given, stimulate or enhance luteinization in women's ovaries or even produce follicle ripening, as they do experimentally. There is, however, considerable clinical support for their value in inhibiting truly functional uterine bleeding, although not consistently in the amounts injected. The mechanism of this inhibition is unknown. Until recently no standard of assay for chorionic gonadotropin had been adopted universally, so that what one manufacturer labeled as 100 rat units might have been less or more than 100 rat units according to the standard of another concern. Considering the large amounts of this hormone in the blood and urine of pregnant women, it is only logical that large amounts must be administered to obtain clinical results. This hormone is worth a trial, then, in otherwise recalcitrant true functional flowing.

Estrogenic substances are covered by various terms such as female sex hormone, ovarian hormone, Folliculin, estrin and Menformon. They are derived from urine of pregnant women, human placentas and pregnant mares' urine. The difficulty in naming estrogenic substances is apparent, for there are three of them, the so-called native estrogens, and they have a number of functions. The names of these, estrone, estriol and estradiol, connote only one of their functions, that is, the ability to produce an objective sign of estrus, namely desquamation of cornified cells from the vaginal mucous membrane. The structure of these hormones and their chemical interrelations have been well established. So far as we now know, they all are similar as regards their physiological properties, although they differ in estrogenic potency. In experimental work the estrogens have been found to have many interesting effects, but their roles in normal and pathologic states in women are only now beginning to be exposed. In adequate dosage they are effective both when taken by mouth and when injected intramuscularly, usually in solution in vegetable oil. By mouth five to ten times as much is necessary as by injection. The estrogens in any of the amounts thus far given to human beings are apparently harmless. This is not surprising considering the enormous quantities elaborated in the body, especially during the latter months of pregnancy.

Let us review some of the actions of the estrogens. Menstruation has been prevented by the administration of tremendous amounts. Presumably, functional flowing could also be stopped in this way. It would be a costly therapy, and on theoretical grounds might be harmful. The giving of estrogen to animals under certain conditions results in enhancement and persistence of their corpora lutea with prolonged progestin effects. On this basis the administration of estrogen to women at the time of ovulation and luteinization ought to foster a better progestin effect. This is one reason for prescribing estrogen for sterile women, together with the performance of other maneuvers. Right from the start of pregnancy in women there is marked and progressive increase in estrogen production, apparently first by the ovary and then by the placenta. So we think of estrogen as involved in the stimulation and enhancement of progestin, which is so important for preparing the ovum's implantation site and for the maintenance of pregnancy.

The estrogens are necessary for proliferation of the endometrium, and progestin, in turn, cannot act satisfactorily unless the endometrium has been prepared by estrogens — nor can progestin continue to be effective without estrogens.

As regards lactation: the breasts will not respond fully to the lactogenic hormone of the pituitary gland unless estrogens and progestin have played a part in their preparation. On the other hand, lactation will not take place if there is too much circulating estrogen, as in cases with retained functioning placental tissue, which probably secretes the tremendous amounts of estrogen found in pregnancy. Therefore, in order to prevent lactation the administration of much estrogen may be

undertaken in conjunction with but not to the exclusion of the usual simple measures.

Sore breasts before menstruation are thought to be associated with some imbalance of the pituitary and ovarian hormones that affect the breasts. The condition has not yet been explained, though empirically estrogens often provide relief. Some patients with unmistakable cystic disease of the breasts, especially if there is associated pain, seem to be benefited by prolonged ingestion of estrogen, but there is as yet no clear indication for such therapy, and relief thereby cannot be confidently anticipated in any given case. Our knowledge of the etiology of cystic disease is still too hazy.

Estrogens are necessary for the growth and activities of the uterus, tubes and cervix. They play a large part in the pelvic blood supply, as evidenced by the vascular hypertrophy of pregnancy on the one hand and the atrophy of castration on the other — and these vascular effects include the vagina and vulva. In addition, the estrogens have a direct influence on the epithelium and underlying tissues of the vagina and vulva, causing the epithelium to thicken and the underlying tissues to become more elastic. Hence the rationale of estrogen therapy in vaginitis, both prepubertal and senile, in conditions associated with vulval atrophy, such as kraurosis and leukoplakia, in genital hypoplasia and in conditions, such as amenorrhea and sterility, where an increase of these effects seems desirable.

Progestin, a secretion of the corpus luteum and of the placenta, is chemically not very different from the estrogens and is rather closely related to the male hormones. Interestingly enough, some of its actions can be duplicated with male hormones. Progestin for clinical use is synthesized under the name of progesterone. Progestin, of course, is necessary for the proper preparation of the endometrium for nidation of the fertilized egg and for the development of the decidua; in fact, it appears to be necessary throughout the whole of pregnancy. This substance can inhibit menstruation, and stops functional flowing if given in large enough amounts, but it is still costly to make and much more costly to buy. There seems to be no clear indication for it in the treatment of essential dysmenorrhea, especially since this type of dysmenorrhea characteristically occurs in patients who ovulate and have corpus luteum activity. Since progestin is so important in pregnancy, one thinks of it in connection with habitual abortion and threatened miscarriage or premature labor, and it certainly rates a trial in these conditions, but not in homeopathic doses. If, in adequate dosage, it fails to prevent abortion, we must remember that a large percentage of spontaneous abortions are sequelae of blighted ova. Miscarriage or premature labor, of course, may be due to other known and unknown causes in addition to possible lack of progestin. This hormone must be injected intramuscularly. With the quantities thus far tried, no sign of toxicity has ensued.

Before proceeding with considerations of possible practical uses of the hormones in specific clinical situations, I should like to pass judgment on the hormone tests. In the first place, as I see it, the chief value of the pregnancy tests (for the presence of chorionic gonadotropin) lies in helping to make the diagnosis of chorionepithelioma, and in detecting its early recurrence. As regards normal pregnancy, these tests simply confirm one's suspicions a little earlier than otherwise, and thereby allay the suspense of waiting until the diagnosis is obvious. In the differential diagnosis and treatment of ectopic gestation one must be guided by clinical judgment. In cases with disease contraindicating gestation the diagnosis becomes apparent in ample time for proper measures. Unorthodox and provocative as the statement may seem offhand, I know of no instance in which a pregnancy test was absolutely necessary for the proper clinical management of a case — with the exception of mole or chorionepithelioma. Furthermore, tests for the pituitary gonadotropic factor in human urine, by the methods available and in the present state of our knowledge, are in our experience of no clinical value. Finally, tests for estrogenic substances are still in the realm of research. Since the normal levels of urinary estrogens vary over wide limits throughout normal cycles, repeated specimens over a period of at least one month must be analyzed in order to secure any information about an individual case. Methods of analysis have not been standardized. They are expensive and time-consuming. There is no specific chemical reagent that can measure the estrogens with any degree of accuracy, and bioassay, in order to give dependable results, requires a large number of animals. For these reasons, tests for estrogens are of no practical value to the clinician attempting to diagnose a case. The best test for the presence of the corpus luteum hormone in the non-pregnant woman is to obtain by suction curet a biopsy of the endometrium before menstruation. If it shows a secretory, that is, a progestational, endometrium, this is definite evidence of the presence of progestin. Progestin is not excreted in the urine as such; it is found there in the form of pregnanediol, and in such small amounts in the non-pregnant that the test for it is really only qualitative and hence gives no more information than does a biopsy.

Thus, although investigation of the blood content and urinary excretion of these hormones and their metabolic products is slowly increasing our knowledge and understanding, it is a waste of money to have any but the pregnancy test done as a clinical procedure. I myself believe this is performed too often to confirm already suspected normal pregnancies, and too infrequently on patients who are candidates for chorionepithelioma to facilitate the diagnosis, for which repeated quantitative assays on blood serum are even more preferable.

Clinical Considerations

There is no hormone therapy for the "bearded lady." It is usually impossible to find the cause of abnormal hair growth, much less to stop or cure it. When it is part of an adrenal or ovarian tumor syndrome, that is another story.

There is no female sex hormone therapy for obesity, but at this word our thoughts turn to metabolism, thyroid therapy and diets, and this triad, it seems to me, is still the backbone and mainstay of the treatment of functional disorders in the female. Obese patients, and those with amenorrhea, dysmenorrhea, profuse menstruation or prolonged flowing of functional origin and sterile women, in the absence of any obvious pathologic condition, deserve a metabolic study, the giving of thyroid preparations on the slightest indication, and a careful revision of the diet.

Sexual frigidity may have such a complex background that a definite place for hormones in its treatment is difficult to determine. A few patients of mine, while taking 200 to 600 rat units of estrogen daily by mouth, have spontaneously volunteered the information that sex activity was more satisfactory.

Amenorrhea, in the absence of demonstrable constitutional disease and of any desire for pregnancy, is not in itself an indication for any attempts at treatment beyond the possible giving of thyroid and a complete diet. It is sometimes possible to produce a sort of menstruation by the proper, and costly, amounts of estrogen and progestin, but this is valueless without ovulation. When primary amenorrhea is complicated by sterility, the problem is at present practically insurmountable. When secondary or acquired amenorrhea is complicated by sterility an occasional success is achieved, but not by sex hormone therapy, although this may be considered a supplementary aid. In simple amenorrhea, either primary or acquired, we do not usually know where to lay the blame — on the pituitary gland, ovaries, endometrium, blood vessels, nervous system or general imbalance. I know of no laboratory procedures that provide a reliable means of differentiating the causes of amenorrhea. Reports are appearing rather frequently on the value of small doses of x-radiation to the ovaries in amenorrhea, the rationale being to inactivate completely for a short while such ovarian function as there may be, in the hope that the return of function will be exaggerated to the point of normalcy. The role of inadequate diet in the production of acquired amenorrhea is perhaps too often overlooked. Menstruation may recur within a year on a carefully planned, complete diet. In addition to diet, thyroid and possibly x-radiation, it seems worth while to prescribe at least 500 rat units of estrogen by mouth daily with the idea of stimulating the whole genital apparatus.

As to sterility, once tubal patency is established by insufflation, the condition of the cervix and vagina rendered satisfactory, the occurrence of ovulation indicated by a secretory endometrium on biopsy late in the menstrual cycle and the semen found adequate, sterile or infertile couples seem to be helped more by the mechanical procedures of insufflation or endocervical irritation following intercourse between eight and fifteen days after the start of menstruation than by any hormone administration. Beyond the giving of dietary instructions and thyroid, I make it a routine to prescribe 200 to 400 rat units of any sort of estrogen by mouth daily for the woman for months. The rationale for such estrogen therapy lies in the possibility of enhancing the influence of the ovarian hormones on the whole genital tract. This measure has seemed, in quite a few patients, to have played a role in achieving the desired result.

For the treatment of essential dysmenorrhea, the administration of any of the sex hormones has no proved physiological rationale and cannot be counted upon for any effect. This disability can be so favorably influenced by so many empirical procedures — general health measures, antispasmodics, sedatives, heat, dilatation of the cervix and so forth — that in the ordinary case it seems unwise to resort to hormonal therapy until more information is available. However, I do not wish to go on record as decrying completely the use of hormones for essential dysmenorrhea. After all, patients have experienced relief from the premenstrual or early menstrual administration of chorionic gonadotropin, or of large amounts of estrogen, or of moderate doses of progestin, or from the injection of large amounts of estrogen earlier in the cycle, or from the daily ingestion of estrogen throughout the cycle. Such results cannot be entirely a matter of coincidence, since these hormones are so causally involved in endometrial

processes. Until the physiology of menstruation is better understood, however, the right combination and dosage cannot be determined and benefit from hormone therapy will be largely a matter of luck.

Varying degrees of premenstrual tension, as expressed by premenstrual headaches, depression, irritability, decreased efficiency, sore breasts and a tendency to scantier menstruation, are of rather common occurrence. Presumably these symptoms reflect some sort of imbalance between the pituitary gland and the ovaries. The daily ingestion of about 500 rat units of estrogen throughout the cycle is definitely beneficial, due regard being given also to the possible need of thyroid therapy.

The chief problem in premenopausal functional uterine flowing is to rule out possible concomitant malignant disease. Ovarian conservation not being an important consideration in these older women, effective cure can be achieved by irradiation. With younger persons, functional flowing may become a difficult problem, but practically never should hysterectomy be necessary. In addition to general measures, such as an improved diet and iron for anemia, thyroid for any decrease in metabolism is surely important, and I find it worth while to increase the dose of thyroid during the periods of flowing — up to 6 to 8 gr. of the accepted most potent preparations daily for as long as three or four days, if the patient can stand this dosage. This in itself may be salutary. We all know that curettage may or may not be followed by a temporary remission of flowing or even a return to normal, but we cannot count on this operation as a lasting therapeutic procedure. If the above measures fail, a trial of chorionic gonadotropin seems warranted — best injected during the flow and in daily doses of at least 500 rat units. The corpus luteum hormone, progestin, seems to be the specific cure, but adequate amounts — at least 5 mg. daily — are prohibitively expensive for the general run of patients. Testosterone, being so closely related to progestin, has been found of value in functional flowing and is somewhat cheaper than progestin, but frequent injections of 5 to 25 mg. are required. With this dosage of the male hormone, moreover, acne, increase of facial hair and lowered pitch of voice are more than theoretical possibilities. When all the pros and cons are weighed, there seems still to be a place for temporary inhibition of the ovaries by irradiation in recalcitrant functional bleeding in younger women, though not until all the more conservative measures have failed.

The estrogens seem to have earned a place for themselves in the treatment of gonorrheal vaginitis in the young. Their dosage should be large enough to ensure hypertrophy and desquamation of the vaginal epithelium — at least 500 rat units daily by mouth or from 100 to 200 by suppository. A synthetic product like Stilboestrol will probably be found most satisfactory for conditions in which a vaginal or vulval response is desired, and even for other conditions, but it is still a little early to make final statements about this substance. I tend to question the need of estrogens as a routine for vaginitis in the old. The vaginitis I see in elderly women is almost invariably the trichomonas variety and is controlled, usually, by any of a number of measures, my own preference being for properly administered vinegar douches to vagina and vulva (4 to 6 tablespoonfuls of vinegar to 2 quarts of sterile water, with the level of the bag adjusted so that the douche runs for at least seven minutes, with the patient lying down and with the nozzle being kept in motion around the top of the vagina). Pruritus of the vulva raises a number of considerations, once diabetes has been eliminated as a cause. In the absence of any focal lesion suspicious enough to deserve biopsy, and in the absence of marked kraurotic and leukoplakic changes for which operation should be contemplated, one should consider fungous infections. Once the known causes of pruritus have been ruled out or treated without relief, it would seem better to try estrogen rather than to inject alcohol or other destructive agents under the vulvar skin. Local inunctions with estrogen in lanolin are being found beneficial, although such a procedure if prolonged involves the theoretical possibility of cancer incitation. In spite of these measures, the occasional patient will come to superficial vulvectomy, a simple and satisfactory operation.

For the symptoms of the menopause the employment of estrogen is now established. One difficulty I have encountered is that symptoms may reappear on the reduction or withdrawal of the hormone. I have come to the conclusion that if a patient can "take" her menopause, as it were, it is better to let the adjustment carry through to its end point with the aid of simple sedatives rather than to run the chance of keeping it teetering along with estrogen. For the occasional patient severely afflicted with mental disturbances of menopausal origin or exacerbation, the estrogens are a really important adjuvant, in amounts which must be determined by trial. Painful joints not infrequently are a phenomenon of the menopause. Even in moderate dosage, estrogen may give considerable or complete alleviation.

No endocrine abnormalities have been proved to cause or accompany the nausea and vomiting of early pregnancy. This disability, however, takes

place during the period when the ratio of chorionic gonadotropin to the estrogens is greater than at any other time in pregnancy. For this reason, attempts to relieve nausea and vomiting, before it becomes pernicious, by the supplementary administration of estrogen have been made — sometimes with apparent consequent relief, provided the hormone is given unsparingly, that is, 1000 to 2000 rat units daily by injection or 2000 to 10,000 by mouth. It is likely that estrogen will be valueless once pernicious vomiting has developed.

In cases of habitual or threatened abortion a lack of progestin has not been conclusively demonstrated, but since we are aware of the necessity of progestin for proper gestation, a trial of this hormone seems indicated. In order to be effective it would appear that progestin should be given in more than just 0.5-mg. or 1-mg. doses. The quantity of pregnanediol excreted before the third month of pregnancy suggests that at the very least 10 mg. of progestin are being formed in the body daily — and it is likely that pregnanediol represents only a part of the secreted progestin. I believe that if progestin is to have a chance to show its value it should be injected in 10-mg. amounts daily or twice a day, both for habitual or threatened abortion and for threatened miscarriage or premature delivery, along with the other accepted measures for these conditions.

Although our own studies and those of other investigators have demonstrated a marked endocrine imbalance in toxemia of late pregnancy, hormone therapy in these cases is still in the realm of research and not clinically applicable. When toxemia becomes manifest a marked deficiency of estrogen and progestin appears to pertain, but satisfactory replacement therapy requires prohibitively costly amounts and unjustifiably large and repeated injections, for the quantities of those substances secreted normally in late pregnancy are comparatively tremendous. For the present, we regard the discovery of an endocrine imbalance in toxemia of pregnancy simply as a clue which may lead to further enlightenment.

There are two reasons for the present indecisiveness concerning the clinical application of the female sex hormones. The first has to do with our still very incomplete knowledge of endocrine production, relations and metabolism in normal and pathologic states, due in part to the still laborious and inaccurate methods of quantification. The other has to do with inadequate dosage. What with the expense of materials and the difficulty of procuring potent preparations, clinical trials until recently have been hampered.

In this review I have limited myself to a discussion of what at present seem to be practical clinical applications of the female sex hormones. From experimental studies there are other possible uses which I could have mentioned, such as the injection of anterior lobe gonadotropic extract followed by chorionic gonadotropin in cases of sterility and amenorrhea, with the knowledge that these two substances are synergistic in stimulating ovaries experimentally, but clinical results thus far have been disappointing. Every now and then a sterile patient has become pregnant after the administration of chorionic gonadotropin, but for every success there have been many failures, and it is impossible to demonstrate that the hormone was the specific cause of success. There is much laboratory evidence that estrogen and progestin are complementary in their action when properly balanced; that is, the normal metabolism, utilization and physiologic effects of one are fostered and enhanced by the presence of the other, — a situation which obtains in the normal mature woman, both non-pregnant and pregnant, — but as yet there have been few clinical trials with this combination.

In summary, anterior lobe gonadotropic, pregnant mare serum and lactogenic extracts have as yet no established place so far as clinical use in gynecology is concerned. Chorionic gonadotropin is now part of the physician's armamentarium for the treatment of functional uterine bleeding. Estrogenic substance has well-founded value in gonorrheal vaginitis and in the management of disturbing menopausal manifestations and some value in amenorrhea, sterility, senile vaginitis and vulvitis. Empirically it has been found helpful in relieving disturbing premenstrual symptoms and the mild nausea and vomiting of early pregnancy. Essential dysmenorrhea may be favorably influenced by trials with the female sex hormones aimed at changing their balance in the body at the time of menstruation. Progestin is apparently becoming an aid in habitual or threatened abortion and in threatened miscarriage or premature labor. The expense of adequate dosage has probably retarded its optimum application to these conditions and to the treatment of functional uterine bleeding. Of the biological tests for the female sex hormones, that for pregnancy is as yet the only one of any practical diagnostic value to the clinician. Thyroid therapy and a carefully planned diet still retain their importance in the management of the so-called functional disorders of women.

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UREMIA FOLLOWING X-RAY THERAPY IN LEUKEMIA*

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THE rarity with which uremia is mentioned in the literature as complicating the x-ray treatment of leukemia prompts the reporting of 3 such cases, seen during the last five years.

From 1927 to 1939, 40 cases of leukemia, myeloid, lymphatic or monocytic, were treated at the Pondville Hospital. In 18 of these death occurred at the hospital or within twenty-four hours after leaving it. Three of the latter cases, which were associated with uremia and occurred shortly after the administration of x-ray therapy, form the basis of this report.

As early as 1870 Salkowski[1] demonstrated an increased output of uric acid in the urine of a patient with "splenic leukemia." This finding has been confirmed by many later authors: Magnus-Levy, Pribram and Rotky, Brugsch and Schittenhelm (quoted by Jugenburg and Tschotschia[2]). Studies following x-ray therapy have shown a still further increase in uric acid excretion, as noted by Musser and Edsall,[3] Lossen and Morawitz and others (quoted by Jugenburg and Tschotschia[2]), Joël[4] and Bedrna and Polcak.[5] The occurrence of gout as a result of hyperuricemia in leukemia was reported as a rare complication by Brugsch and Schittenhelm in 1908 (quoted by Jugenburg and Tschotschia[2]).

Bedrna and Polcak[5] have reported 2 cases of leukemia (1 myeloid and 1 lymphatic) which within a few days of x-ray therapy developed ureteral obstruction from uric acid calculi. The calculi were passed following ureteral catheterization and the patients left the hospital a few days later, benefited by their x-ray treatment.

Jugenburg and Tschotschia[2] in a most interesting paper, published in 1931, reported some detailed studies of the uric acid metabolism in cases of leukemia undergoing x-ray treatment. A translation of their conclusions is as follows:

> The state of the purine metabolism is a measure of the clinical severity of the leukemia.
>
> Increasing blood uric acid can be caused either by increasing destruction of nuclei of white cells or diminished excretion because of renal insufficiency.
>
> In cases responding favorably to x-ray there is an increased urinary output and a normal blood level of uric acid at the end of treatment.
>
> In fatal cases of leukemia severe changes in the kidneys can be demonstrated. These changes are partly of a degenerative nature and partly leukemic infiltrations of either myeloid or lymphatic cells.
>
> In fatal cases of leukemia there is always diminished excretion of uric acid and accumulation of the same in the blood. [This would hardly seem to apply to cases dying of sepsis without elevation of the nonprotein nitrogen.]
>
> The determination of the uric acid quotient [a figure obtained by dividing the blood uric acid in milligrams per 100 cc. by the twenty-four-hour urinary uric acid output in grams] is just as important as the examination of the peripheral blood during x-ray treatment.
>
> A significant increase of the uric acid quotient shows the approach of menacing intoxication.
>
> In the treatment of leukemia one must take great care to relieve the organism as much as possible from endogenous and exogenous uric acid. Therefore the diet should be as low as possible in purines and x-ray should be given in small doses.
>
> Every case of leukemia should be regarded as having more or less renal insufficiency.

In their paper Jugenburg and Tschotschia cite 4 cases with falling uric acid quotients associated with good responses to x-ray therapy, and 4 cases with rising quotients and death occurring shortly after completion of the x-ray treatment. In 2 of their reported fatal cases the patients died with blood uric acid levels of 13.2 and 16.0 mg. per 100 cc., whereas the other 2 had levels of only 6.1 and 5.3 mg.

Nemenow,[6] working in the same Leningrad clinic as Jugenburg and Tschotschia, applied their findings to the planning of x-ray therapy. From their demonstration of the importance of the functional efficiency of the kidneys in determining the response to x-ray treatment, he reasoned that it should be given in small doses at generous intervals in order to spare the kidneys as much as possible, and that it should first be applied directly to the kidneys, in order to remove leukemic infiltrations therein and thus increase their functional efficiency before loading them with uric acid from x-ray treatment applied over other bulky leukemic deposits, such as those in the spleen, lymph nodes and bone marrow.

Nemenow suggested treating the right kidney before the left because of the possibility of some effect on the spleen while radiating the left kidney. He used initial doses of 125 to 240 r. He reported 2 cases of myeloid leukemia treated in this way. The first had a blood uric acid content of 10 mg. per 100 cc. and a uric acid quotient of 18.8 at the beginning of treatment. The blood uric acid content was reduced to 4.8 mg. and

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the quotient to 4.4 after radiating the kidneys alone. The second case had a blood uric acid content of only 6.6 mg. per 100 cc., but a quotient of 13, which was reduced to 3, with a corresponding reduction of the blood uric acid content to 4 mg. Both cases were markedly benefited by x-ray therapy.

The following case illustrates a fatal uremia following x-ray therapy for leukemia.

CASE 1 (P. H. No. 12941). A. M., a 56-year-old man, was referred to the hospital for x-ray treatment of myeloid leukemia on August 21, 1937. He gave a history of increasing weakness, pallor and a loss of 30 pounds of weight in 3 years, increasing dyspnea and vertigo for 3 months and deafness for 2 weeks.

On physical examination, the only significant findings were bilateral deafness and an enlarged spleen, extending from the left flank to the midline and from the costal margin to the umbilicus. The hemoglobin was 54 per cent (Sahli), the red-cell count 2,940,000 and the white-cell count 237,500. The differential count showed 71 per cent polymorphonuclears, 1 per cent lymphocytes, 2 per cent eosinophils, 5 per cent basophils, 12 per cent myelocytes, 6 per cent metamyelocytes and 3 per cent myeloblasts. The platelets were present in normal numbers in the smear, and the red cells showed marked anisocytosis. The nonprotein nitrogen was 52 mg. per 100 cc. The phenolsulfonephthalein excretion of the kidneys was 15 per cent in the 1st hour and 15 per cent in the 2nd, a total of 30 per cent in 2 hours.

The patient received 900 r of x-ray in divided doses, applied to the spleen. The white-cell count had dropped to 15,000 at the time of his discharge a month later; the spleen became barely palpable, the vertigo disappeared but the deafness was unaltered.

The patient returned to the hospital 9 months after his first admission because of discomfort in the region of the spleen. The latter extended 6 cm. below the costal margin. The white-cell count was 341,200, and the hemoglobin 52 per cent. Another 900 r was delivered to the spleen in nine treatments and 900 r was also given on each side of the head in the hope that the deafness might be improved, if caused by leukemic infiltration of the 8th nerves.

After 1 month in the hospital the patient was discharged, with a white-cell count of 34,000 and a considerably smaller spleen, but without any improvement of hearing. He returned again 5 months later (15 months after his first admission) because of pain in the left side and weakness. The spleen was again 6 cm. below the costal margin, and there was a coarse friction rub audible and palpable over it. The white-cell count was 269,000. The patient received 800 r, applied to three different areas of the spleen. He was again discharged considerably improved after a month's stay with a white-cell count of 97,000, a hemoglobin of 47 per cent and a red-cell count of 2,340,000.

The patient re-entered the hospital for the fourth and last time 3 months later (19 months after his first admission) because of recurrence of pain in the left flank. The spleen extended below and to the right of his umbilicus and there was a friction rub over it, again both audible and palpable. The white-cell count was 210,000, the hemoglobin 60 per cent and the red-cell count 2,950,000. The blood nonprotein nitrogen was 47 mg. per 100 cc.

X-ray treatment was repeated, this time four treatments of 100 r each being applied to two portals 10 by 15 cm. over the front and back of the spleen on successive days. The white-cell count dropped rapidly to 90,000 in the first 11 days after admission. Two weeks after entry the patient complained of burning on urination and vague abdominal pain and distention. Two days later he began to vomit and seemed a little drowsy. The white-cell count had dropped to 39,500, the hemoglobin to 57 per cent and the red-cell count to 2,910,000, but the nonprotein nitrogen had risen to 148 mg. per 100 cc. and the phenolsulfonephthalein test showed no excretion of the dye in 2 hours. Six days later (3 weeks after admission) the white-cell count was 9400, the nonprotein nitrogen 151 mg. per 100 cc., the creatinin 9.76 mg. and the uric acid 12.3 mg. From this time on the patient's condition steadily became worse; the white-cell count continued to fall until 2 days before death (32 days after admission) when it was 3800 and the nonprotein nitrogen was 244 mg. per 100 cc.

Autopsy. A postmortem examination showed the usual findings of chronic myeloid leukemia, but the kidneys were of unusual interest. The right kidney weighed 235 gm. The cut surface showed a cortex of normal width. The capsule stripped with ease, leaving a coarsely granular surface. In the calyces were moderate numbers of small, yellowish-gray calculi. There was no obstruction of the ureter. The left kidney weighed 250 gm. In its upper pole was a cyst 7 cm. in diameter, filled with clear fluid and having a smooth lining. On section the cortex measured up to 8 mm. in thickness. Scattered throughout the cortex and medulla were many small, gray foci on a yellowish-pink background. The capsule stripped easily, leaving a coarsely granular surface. The calyces were packed with gravel-like calculi having a yellowish-gray color. In the two major calyces were larger stones measuring 2 by 1 by 1 cm. Their surfaces were smooth. Chemical tests showed these calculi to be composed of uric acid and urates. The first portion of the left ureter was packed with gravel-like calculi; the remainder of it was normal.

Microscopic examination showed an occasional small cortical scar in the left kidney, containing atrophic tubules and rare hyalinized glomeruli. Scattered collecting tubules in the cortex and medulla contained a finely and coarsely granular basophilic material. The epithelium of some of these tubules was degenerated. In the right kidney were multiple foci of necrosis in the cortex and medulla having the appearance of that of an ascending infection. The foci were heavily infiltrated by polymorphonuclears and often contained fibrin and large clumps of bacteria. Near-by tubules and stroma contained polymorphonuclears. There was slight intimal thickening and hyalinization.

It is possible that this patient's uremia was precipitated by x-ray therapy. However, it is interesting that on three previous occasions he had tolerated larger amounts of x-ray delivered to the spleen with gratifying clinical improvement, even though he gave laboratory evidence on his first admission of definitely impaired kidney function.

The following cases are not so striking as the first, but are reported as representing possible examples of renal insufficiency accentuated by x-ray treatment of leukemia.

CASE 2 (P. H. No. 7539). J. D., a 51-year-old woman, was sent to the hospital on March 3, 1934, with a diagnosis of malignant melanoma of the leg. Six years previously she had first noticed a small "pimple" on her left leg.

This had grown slowly and bled frequently after slight trauma. A doctor had advised its removal a year before admission, but she had refused. Following tonsillitis 3 weeks before entry she noticed some small lymph nodes in the neck. One week later she was seen in a tumor clinic and referred to the hospital with a diagnosis of melanoma. The past history included a radium-induced menopause for menorrhagia 4 years prior to entry.

On physical examination the patient appeared fairly healthy, but there were many small, discrete, relatively soft, freely movable lymph nodes in both sides of the neck, in both axillas and in both groins. These varied from 0.2 to 2 cm. in diameter. The spleen filled the entire left flank and descended below the umbilicus. The liver was not felt. There was a mass deep in the right flank which felt like a large kidney. A small, pedunculated, dark-red, vascular tumor about 2 cm. in its longest diameter was attached to the skin of the left shin.

The hemoglobin was 66 per cent (Sahli). The red-cell count was 3,390,000, and the white-cell count 191,000, with 95 per cent mature lymphocytes. A blood Hinton test was negative, and the nonprotein nitrogen was 43.7 mg. per 100 cc. The urine was acid, had a specific gravity of 1.024 and showed a trace of albumin. The sediment showed 15 white cells per high-power field.

Diagnoses of chronic lymphatic leukemia and an unclassified papillary tumor of the left lower leg were made.

The patient was given 600 r of x-ray in six treatments, applied to the spleen, three anteriorly and three posteriorly, in 3 days. One hour after the first treatment nausea and vomiting began and lasted for 2 days. Three days later there occurred a transient episode of severe pain in the right flank, associated with localized spasm and tenderness lasting for 2 hours. The white-cell count was 65,000. Three days later the patient had a severe nosebleed, and the following day the white-cell count was 34,500. She felt better, though still a little nauseated and somewhat bothered with burning on urination.

Nine days after the first x-ray treatment there was an attack of severe pain in the left flank, which was thought to be due to a perisplenitis. The urine, however, showed large amounts of albumin and both red and white cells in the sediment. Four days later the white-cell count was 17,900 and the spleen was much smaller although still reaching almost to the umbilicus, but the patient was nauseated and quite drowsy. The next day the nonprotein nitrogen was 204 mg. per 100 cc. and the patient was obviously in uremic coma. She died the following day, 15 days after the institution of x-ray therapy.

Autopsy was refused, but a postmortem biopsy of the tumor on the leg was done. This showed the skin heavily infiltrated with newly formed blood vessels, masses of lymphocytes, a few lymphoblasts and some connective tissue. There were many foci of hemorrhage and heavy deposits of golden-brown pigment. A diagnosis of lymphatic leukemia was made.

It seems possible in retrospect that the episodes of severe pain in the flank, first on the right and then on the left, associated with large numbers of white and red cells in the urinary sediment, may have been due to ureteral calculi. It is also possible that x-ray treatment hastened this patient's death, although there was definite evidence of renal impairment before x-ray treatment had been begun.

Case 3 (P. H. No. 11306). E. M. S. P., a 65-year-old woman, was sent to the hospital because of a large spleen on August 13, 1936. She gave a vague history of weakness, a loss of 75 pounds and a lump in her left side for several years and easy bruising and profuse nosebleeds for 1 month. She also had had a lump in her left breast for 8 years, which had been ulcerated for 4 months.

On physical examination the patient was obviously emaciated and chronically ill. In the left breast was a small, hard, nodular, ulcerated mass 3 cm. in diameter, and there was a hard lymph node 2 cm. in diameter in the left axilla. The abdomen was relaxed and the entire left side was filled by a huge spleen extending into the pelvis. The liver edge was felt 4 cm. below the right costal margin. The hemoglobin was 30 per cent (Sahli), the red-cell count 2,000,000, and the white-cell count 380,000. The differential count showed 60 per cent polymorphonuclears, 5 per cent eosinophils, 2 per cent basophils, 26 per cent myelocytes and 7 per cent myeloblasts. The basal metabolic rate was +39 per cent. A blood Hinton test was negative, and the blood nonprotein nitrogen was 65 mg. per 100 cc. The urine showed an acid reaction, a specific gravity of 1.016 and a trace of albumin; the sediment contained 30 white cells and 4 red cells per high-power field.

A diagnosis of chronic myeloid leukemia was made, and the question of carcinoma of the left breast was raised. X-ray treatment to the spleen was begun on the day after entry and 100 r was given daily for 4 days. One week after admission the white-cell count was 106,000, but the nonprotein nitrogen had risen to 71 mg. per 100 cc. The blood urea nitrogen was 12 mg. per 100 cc., the uric acid 27.3 mg., and the aminoacids 11.8 mg. Five days later the patient was nauseated and vomiting. Two days later (2 weeks after admission) she was in definite uremia with a nonprotein nitrogen of 147 mg. per 100 cc. The white-cell count had dropped to 84,000. The urine showed an acid reaction, a specific gravity of 1.013 and a trace of albumin. The sediment showed 15 white cells and 20 red cells per high-power field. Four days later the nonprotein nitrogen had risen to 188 mg. per 100 cc. and the white-cell count had fallen to 49,000. Two days later the white-cell count was only 25,100 and the tip of the spleen was just above the umbilicus. The patient was moribund, however, and died the following day, exactly 20 days after the beginning of x-ray therapy.

Autopsy. Postmortem examination, in addition to the characteristic findings of chronic myeloid leukemia, showed a carcinoma simplex of the left breast, with metastases to the axillary nodes. The kidneys showed some grayish-white, inspissated material in the right kidney pelvis, and microscopically there were foci of lymphocytic infiltration, hyalinized glomeruli and atrophied tubules. The large vessels showed subintimal thickening. About the pelvic fat in one section was a mass of loose connective tissue in which were collections of leukemic cells.

In retrospect this patient's death quite possibly was accelerated by x-ray therapy, although here too there was laboratory evidence of considerable renal impairment before x-ray treatment was begun.

Discussion

It has been shown that x-ray treatment of leukemia, myeloid or lymphatic, results in an enor-

mous increase of uric acid production within the body which has to be excreted by the kidneys. This increased burden might conceivably precipitate clinical uremia if the kidneys were sufficiently damaged either by leukemic infiltrations or by non-leukemic lesions. There is a real danger of the formation of uric acid stones anywhere along the genitourinary tract, which may further hamper the functional efficiency of the kidneys.

With the above facts in mind, the following therapeutic regime is suggested as a means of minimizing the danger of precipitating uremia or the formation of uric acid stones in leukemic patients undergoing x-ray therapy.

(1) Preliminary study of the blood levels of nonprotein nitrogen and uric acid and of the twenty-four-hour urinary excretion of uric acid before beginning x-ray treatment, and pyelographic and phenolsulfonephthalein excretion studies, if significant nitrogen retention exists.

(2) A low-purine diet and liberal quantities of fluid during x-ray treatment.

(3) Administration of alkalies by mouth in an attempt to keep the urinary reaction alkaline and hence lessen the danger of uric acid stone formation (Barney and Sulkowitch[7] and Albright[8]).

(4) Administration of cinchophen prior to x-ray therapy in cases having an elevation of the blood uric acid, because of the known effect of cinchophen in increasing the excretion of uric acid by the kidney in cases of gout and leukemia.[4]

(5) Preliminary radiation of the kidneys according to the suggestion of Nemenow.[6]

(6) Blood uric acid and twenty-four-hour urinary uric acid output determinations every three or four days during x-ray treatment, as a guide to increasing or decreasing the frequency of treatment.

(7) Treatment of extrarenal leukemic infiltrations by frequent x-ray exposures of small doses, spaced according to information obtained from the study of the uric acid metabolism and the blood counts.

Conclusions

Uremia is not a rare complication of the x-ray therapy of leukemia.

The number of leukemic patients dying with clinical uremia following x-ray treatment might be reduced by following a regime, as outlined, designed to spare the kidneys as much as possible from becoming overloaded with large amounts of uric acid and to avoid the attendant danger of either uremia or uric acid stone formation, or both.

51 Brattle Street.

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THE MASSACHUSETTS MEDICAL SOCIETY AND THE BRISTOL SOUTH DISTRICT MEDICAL SOCIETY*

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IN OBSERVING the centenary of the Bristol South District Medical Society, no more appropriate introduction could be offered by the speaker than the words used by Dr. Edward Reynolds in 1841:

> We can hardly assemble on these short occasions without some mutual advantage. If they do not make us much wiser, they always make us happier; for we never separate without some kinder feelings and without acquiring some new interest in each other as well as in the noble cause to which we have consecrated our talents and our lives.

Since we have been on the brink of cataclysmic war for a year or more, we may find profit in reviewing some of the salient points in the stirring times which were successfully bridged by our ancestors. They survived, and so may we. Even Diogenes suffered from the vicissitudes of his time, about 400 B.C. In anticipation of his own death, he directed, "Bury me on my face." When asked why, he said, "Everything will soon be upside down, anyway."

So it is eminently fitting at this time that we should be looking back to the forgotten past, to review some of the great events which led up to the birth of the parent society, and later of this district society, and to gather riches from the memoirs of the great men who labored in laying the foundation of our cultural heritage.

From the settlement of the country in 1620 to the time when the Massachusetts Medical Society was organized in 1781, a period of more than one hundred and sixty years, no systematic effort whatever was made in New England to raise the standard of medical education, or to regulate the practice of medicine. A few able and highly respected physicians, educated chiefly in foreign countries, were to be found in the larger towns; but in general, the profession was in a state of extreme degradation.

A young man who, from choice, ill health or aversion to other pursuits, signified his wish to be initiated into "the arts and mysteries" of healing the sick, would first study Latin grammar with the parish minister, as far as the first personal pronoun. Then he would apprentice himself to some local practitioner for a few months, and, with this meager preparation, enter upon the discharge of his responsible duties. Thus was made the preacher-doctor, the highest type of which was exemplified by Cotton Tufts.

No examination was held, and no license given or required. A skeleton, in those days, was a rare acquisition, and a human dissection created as much consternation among the people as the appearance of a meteor. It was claimed that a knowledge of anatomy was of little importance to a physician, whatever might be the case with respect to the practice of surgery. Medical libraries did not exist, and the few eminent men educated abroad demanded 100 guineas from students, which surpassed the means of those who expected to practice for ninepence the visit. In the cities one shilling and sixpence, and later two shillings, was the customary fee for an ordinary visit.

The American Revolution opened a new field for medical investigation. Joseph Warren, a most conspicuous character of the period, was proposed as physician general, but, preferring a more active, hazardous employment, accepted a major general's commission, and in a few days sealed his principles with his blood at Bunker Hill.

Benjamin Church, a pupil of Joseph Pynchon, was appointed director of hospitals. He served with distinction, but while in office he was charged with treason, tried by court martial in Connecticut and found guilty. He was placed aboard a vessel headed for the West Indies. Nothing was ever heard of him thereafter.

It must be remembered that these were treacherous times. The patriots were virile, courageous men, but suspicious and just plain fighting mad. They brooked no opposition on the part of the native population, and sympathy for the British shown by any of their friends was a criminal offense. Many of the Tory sympathizers, like Edward Augustus Holyoke, were doctors who actually had an impartial attitude, but felt misgivings about the wisdom of undertaking a war against an enemy which was the most powerful nation on land and sea. Holyoke and eleven others suspected of pro-British sentiments were forced to publish a recantation of Toryism on May 30, 1775. Holyoke himself had to make a public declaration on Boston Common.

*A discourse delivered at the centennial anniversary of the Bristol South District Medical Society, New Bedford, May 4, 1939.

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The prudence and sagacity of Washington, which are as easily traced in the archives of science as in the cabinet or the field, instituted the first medical examinations in this state of candidates for practice.

Harvard Medical School was founded in 1770, on the bequest of Ezekiel Hersey. Three other donors were Abner Hersey, John Cummings and William Erving. The sum bequeathed was four thousand pounds. The medical department was not organized, however, until 1782.

During the Revolutionary War military hospitals afforded extensive opportunities for observations and experiments; surgeons became familiar with important operations. Anatomy was greatly improved by the frequent, unhampered inspection of the organs of the human body. Physiology was better understood, and a spirit of inquiry assiduously cultivated.

One of the branch hospitals was located in Boston, with peculiar advantages to students in medicine. In 1780, the first course in anatomy was given with dissections and demonstrations by John Warren, surgeon of that establishment. Students of Harvard University were allowed to attend.

In 1780, the American Academy of Arts and Sciences was incorporated. Ten of the original number were of the medical faculty: David Cobb, Edward Augustus Holyoke, Ebenezer Hunt, Charles Jarvis, Joseph Orne, Theodore Parsons, Oliver Prescott, Micajah Sawyer, John Barnard and Cotton Tufts. The charter provided for the advancement of science and the useful arts, and the encouragement of medical discoveries.

In 1783, at Harvard Medical School, John Warren was installed as professor of anatomy and surgery; Benjamin Waterhouse as professor of the theory and practice of physic; Aaron Dexter as professor of chemistry and materia medica. In 1809 John Collins Warren and John Gorham were chosen adjunct professors of anatomy and chemistry.

Let us pause a moment to review the activities of that small group of men who flourished during the War of the Rebellion. They were thoroughly familiar with the disorganized state of medical practice which had prevailed. Keenly aware of the necessity for organized effort to promote progress by association and mutual co-operation, they set about the task of establishing a society for this purpose.

The act of incorporation of the Massachusetts Medical Society was sponsored by thirty-one physicians. The preface was as follows:

> As health is essentially necessary to the happiness of society; and as its preservation or recovery is closely connected with the knowledge of the animal economy, and of the properties and effects of medicines; and as the benefit of medical institutions, formed on liberal principles, and encouraged by the patronage of the law, is universally acknowledged:
>
> Be it therefore enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, That Nathaniel Walker Appleton, William Baylies, Benjamin Curtis, Samuel Danforth, Aaron Dexter, Shirley Erving, John Frink, Joseph Gardner, Samuel Holten, Edward Augustus Holyoke, Ebenezer Hunt, Charles Jarvis, Thomas Kast, Giles Crouch Kellogg, John Lynn, James Lloyd, Joseph Orne, James Pecker, Oliver Prescott, Charles Pynchon, Isaac Rand, Isaac Rand, Jr., Micajah Sawyer, John Sprague, Charles Stockbridge, John Barnard Swett, Cotton Tufts, John Warren, Thomas Welsh, Joseph Whipple and William Whiting be, and they hereby are formed into, constituted and made a body politic and corporate, by the name of THE MASSACHUSETTS MEDICAL SOCIETY; and that they and their successors, and such other persons as shall be elected in the manner hereafter mentioned, shall be and continue a body politic and corporate by the same name forever.
>
> And be it enacted by the authority aforesaid, That the fellows of said society may from time to time elect a president, vice president and secretary, with other officers as they shall judge necessary and convenient; and they, the fellows of said society, shall have full power and authority from time to time to determine and establish the names, number and duty of their several officers, and the tenure or estate they shall respectively have in their offices; and also to authorize and empower their president or some other officer to administer such oaths to such officers, as they, the fellows of said society, shall appoint and determine for the well ordering and good government of said society, provided the same be not repugnant to the laws of this commonwealth.
>
> And be it enacted by the authority aforesaid, That the fellows of said society shall have one common seal, and power to break, change and renew the same at their pleasure.
>
> And be it enacted by the authority aforesaid, That the fellows of said society may sue and be sued in all actions, real, personal or mixed, and prosecute and defend the same unto final judgment and execution, by the name of the Massachusetts Medical Society.
>
> And be it enacted by the authority aforesaid, That the fellows of said society may from time to time elect such persons to be fellows thereof, as they shall judge proper; and that they, the fellows of said society, shall have power to suspend, expel or disfranchise any fellows of said society.
>
> And be it enacted by the authority aforesaid, That the fellows of said society shall have full power and authority to make and enact such rules and by-laws for the better government of said society, as are not repugnant to the laws of this commonwealth; and to annex reasonable fines and penalties to the breach of them, not exceeding the sum of twenty pounds, to be sued for and recovered by said society, and to their own use, in any court of record within this commonwealth proper to try the same; and also to establish the time and manner of convening the fellows of said society; and also to determine the number of fellows that shall be present to constitute a meeting of said

society; and also, that the number of said society, who are inhabitants of this commonwealth, shall not at any one time be more than seventy, nor less than ten; and that their meetings shall be held in the town of Boston, or such other place within this commonwealth as a majority of the members present in a legal meeting shall judge most fit and convenient.

In the Senate, November 1, 1781.

This bill having had two several readings, passed to be enacted.

SAMUEL ADAMS,
President

Approved by JOHN HANCOCK

Edward Augustus Holyoke was chosen as the first president of the Society. Four years later, in 1785, advisory committees were appointed for the ten different departments, of which Bristol was the ninth. In 1789, the Society drew up a plan of medical instruction requisite for candidates. The period of instruction was to be three years, with attendance on the practice of a respectable physician. The censors met for examining and licensing candidates for practice once in four months. The first licentiate was admitted in 1782.

The public estimation of this society was manifested in the constant patronage of the government. Its grant of a township of land to the Society demands our most respectful acknowledgment.

During the first ten years the operations of the Society were conducted with vigor. Toward the close of that period, however, unhappy personal alienations among some of the leading members existed; several of the most active of the founders had died or had become too infirm to take part in the meetings as formerly, and the Society languished. From 1794 to 1800 the treasurer was directed not to call on the fellows for the payment of their annual assessments.

In the beginning, the number of members was limited to seventy. After an interval of twenty years, however, it became evident that this limitation of membership was a distinct handicap. By an act of the legislature in 1803 the character of the Society was essentially changed. The number of fellows, originally limited to seventy, embraced all respectable practitioners in physic and surgery, and by 1813 the number had risen to two hundred and four, exclusive of honorary members. At this time the population of Boston was twelve thousand. Membership was not limited to Massachusetts physicians, but included men like Moses Appleton, of Waterville, Maine; Samuel Ayer, of Portland, Maine; William Buel, of Litchfield, Connecticut; Micah Eldridge, of Nashua, New Hampshire; George Hooker, of Syracuse, New York; Usher Parsons, of Providence, Rhode Island; and Thomas Sewall, of Washington, District of Columbia.

The first volume of medical papers read at the meetings of the Society appeared in 1808. It included the following:

Edward Augustus Holyoke: "An Account of the Weather and of the Epidemics at Salem."
Hon. William Baylies: "An Account of the Ulcerated Sore Throat as it appeared in the Town of Dighton, 1785 and 1786."
Joseph Orne: "Experiments with the Common Cow Parsnip."
Nathaniel W. Appleton: "Successful Treatment of a Paralysis of the Lower Limbs, Occasioned by a Curvature of the Spine."
Isaac Rand: "A Case of Empyema, Successfully Treated by Operation."
Isaac Rand, Jr.: "Observations on Hydrocephalus Internus."
Hon. William Baylies: "Calculus in the Ureter."
John Warren: "Use and Effect of Mercury."
Josiah Bartlett: "Case of Spotted Fever with Dissections."
Thomas Welsh: "Dissertation on Heat and Cold."

In this same year appeared the *Pharmacopoeia*, prepared by James Jackson and John Collins Warren.

Thus the standard of medical education was raised and intercourse among the members of the profession improved. The fellows of the Society believed it incumbent upon those who cultivated medicine to keep pace with the general progress of human attainments. Later presidents who maintained the same high standard set by Edward Augustus Holyoke were William Kneeland, Cotton Tufts, Samuel Danforth, Isaac Rand and John Warren.

Ebenezer Alden, in his account of the origin and progress of the Massachusetts Medical Society, read May 30, 1838, stated that it could boast of two schools of medicine and that graduates of the Berkshire Medical Institution were entitled to the same privileges as those of the Harvard Medical School. It had a weekly press devoted to medical discussion. Up to the founding of the Society there had been no attempt made publicly in New England to communicate medical instruction, if we except a course of lectures by William Hunter, an eminent physician and surgeon in Newport, Rhode Island, given in 1754–1756, and a short course on anatomical demonstrations in Boston by John Warren, given in the winter of 1780.

Standards of medical practice were raised by the Board of Censors, the members of which were under oath to the faithful performance of their duties, and were subject to a heavy fine for any neglect.

According to Alden, the medical department of

Harvard University was well organized by 1782. At one time, no little friction existed between the faculty of the College and the fellows of the Society on the subject of conferring medical degrees. Finally, by mutual conference the Society obtained assurance that the standard of medical education would not be lowered. Another great benefit to the public good was the legalizing of the study of anatomy. In February, 1829, at a meeting of the councilors, a petition was prepared for the legislature asking for a modification of the laws then existing, which prohibited the procuring of subjects for anatomical examination.

It was felt, however, that the subject was beset with difficulties; time and effort were needed to prepare the public mind for so great a change. Circulars were distributed to the fellows and to other intelligent and influential individuals. As a result, on February 28, 1831, an act was passed legalizing the study of anatomy: "an act" Alden wrote, "which has brought honor on our state, as the first to set an example of such enlightened legislation."

An effort was made to suppress quackery, a very difficult task for the Society. All useful discoveries in medicine were made public, especially those relating to epidemics and unusual diseases; irregular practitioners of every grade were excluded from fellowship in the Society. A system of correct professional conduct was maintained among the members.

I wish now to review briefly the lives of two of the outstanding figures in the founding of the parent society: Edward Augustus Holyoke, the first president of the Society, and William Baylies, of Dighton.

Edward Augustus Holyoke was born in Marblehead on August 1, 1728. His father was Edward Holyoke, of Boston, who was educated at Harvard, and later became pastor of the Congregational Church in Marblehead. In 1737 he was chosen president of Harvard College. President Holyoke married three times, and Edward Augustus was the offspring of the second marriage. In 1742 the boy entered Harvard College. His thesis subject was *Labor Improbus Omnia Vincit,* a motto which guided his future life. He was graduated in 1746, and began the study of medicine with Dr. Berry, of Ipswich, the most distinguished practitioner of the neighborhood. In 1749 he came to Salem to begin a long and useful practice. Six years later he married Judith Pickman, who died in childbirth. In 1759 he married Mary Viall, daughter of a Boston merchant, and by this second wife he had twelve children, ten of whom died of diseases then prevalent in early childhood.

During Holyoke's lifetime the medical profession abounded in discouragements which, to say the least, are greatly lessened in our day. The standard of medical education was totally unsettled.

Few physicians have done so much for the profession as did Holyoke. He made an average of over eleven visits a day for seventy-five years. On one occasion when measles was prevalent, in 1787, he made over one hundred professional visits in a day for several days. He was never averse to trying new remedies, but did it with great caution in order to ensure the safety of his patients.

Holyoke had great urbanity of manners, and was what Bacon has styled a "full" man. His ability and eminence in his profession, united with his great learning, and his fine taste for those arts which embellish human life, made him an ornament, not only to his own profession, but to the nation and age in which he lived.

In one paper he stated:

> It is much to be wished that practitioners would more generally commit to paper their thoughts and remarks upon diseases as they arise, and communicate them to the Society; which, though attended with some labor, would be amply rewarded by the benefit which would accrue to themselves, their patients and the art they profess.

On August 1, 1828, his one-hundredth birthday, Holyoke walked from Salem to Boston in order to attend a public dinner given by his friends. Also the district medical society requested him to sit for his portrait, to be placed in its library. By this time he had completed his *Recollections,* a delightful account of his activities. He walked five or six miles daily, rode horseback occasionally, and had excellent health, except for impaired hearing. On November 24, 1828, he received an injury to his right leg on stepping out of his carriage, and his health declined steadily thereafter. He died March 21, 1829. A postmortem examination was made and all the local physicians were present. What an example, even for the highly advanced culture of today!

William Baylies was born in Uxbridge on November 24, 1743. He was a man of fine mental endowments, and held many positions requiring high intelligence and sound judgment. He frequently held council with the leaders of the medical profession in New England, and by his associates he was considered a master mind. Graduated from Harvard College in 1760, he went to New Bedford to study medicine with Elisha Tobey. He began to practice medicine in Taunton, where he married Bathsheba, the daughter of Samuel White, the first lawyer of Taunton. Their daughter Elizabeth married Samuel Crocker, one of the

first merchants of the town, and one son, Samuel White Baylies, studied law with Governor Sullivan. Another son, William Baylies, of West Bridgewater, was eminent as a lawyer, and still another, Francis Baylies, was one of the leading historians of the Old Colony.

William Baylies was a member of the Provincial Congress, which convened in 1775. During the Revolution, he was often in the councils of the State. In 1784 he was appointed registrar of probate for Bristol County, and was an elector for president and vice-president in 1800. He was an original member of the Medical, the Historical, the Agricultural and the Humane societies of Massachusetts and a fellow of the Academy of Arts and Sciences. A skillful physician and author of many significant medical treatises, he practiced medicine in Dighton for many years.

Altogether too seldom has his name been referred to in the historical references on the early history of the Massachusetts Medical Society; and in this locality there are no commemorative insignia to reveal his importance as one of the founders of the Society.

The two Bristol County medical societies trace their origin to a period when members of the Massachusetts Medical Society were widely scattered throughout the Commonwealth. Travel was slow and expensive. One meeting each year was considered all that the members could reasonably be expected to attend. Therefore, as the Society increased in numbers, district societies were formed, all under the control of the parent society but appointing their own officers, and receiving and disposing of property outside the authority of the Massachusetts Medical Society.

Approaching the time that the Bristol District was formed, it had been the custom of the secretary of the Society to refer to the subdivisions as departments, numbered from one to ten. In 1840, the departments were referred to as districts, designated by the points of the compass. The Southern District included Fall River, New Bedford and the Cape. Later on, the districts were referred to by the county name; and finally, the records show a combination of geographical and county names.

Of the original departments, Bristol was the ninth. The records are in no wise complete, but some facts are known regarding the genesis of the district societies. Because of the difficulties of attending the general meetings, petitions for district societies were presented in the early nineteenth century from members in Suffolk, Essex, Worcester, Berkshire and Hampshire counties, and were granted. These district societies went immediately into active operation, each holding two meetings a year. This arrangement has proved highly useful, and has continued to the present time. The societies acquired libraries, collected medical periodicals and discussed current local problems. They invited lecturers and encouraged the members to take courses in medicine and anatomy. Physicians in Bristol, Plymouth, Dukes and Nantucket counties petitioned for the establishment of a district medical society at a meeting of the Council held October 3, 1838, and the charter which was subsequently granted resulted in the formation of the Southern Medical District Society. The petition read as follows:

> The subscribers hereby make application for the establishment of a district medical society to be called the SOUTHERN MEDICAL DISTRICT SOCIETY; to include the following towns, viz New Bedford, Fall River, Taunton, Freetown, Fairhaven, Dartmouth, and Westport of Bristol County; Middleboro, Rochester and Wareham of Plymouth County; Chilmark, Tisbury & Edgartown of Dukes County and Nantucket, and the place of meeting to be at New Bedford.
>
> ALEXANDER READ
> PAUL SPOONER
> SAMUEL SAWYER
> JULIUS S. MAYHEW
> ANDREW MACKIE
> WILLIAM C. WHITRIDGE
>
> New Bedford, September 12, 1838.

This resolution was submitted by Enoch Hale, S. D. Townsend and John Homans. Soon afterward the name was changed to the Bristol South District Medical Society.

The first officers of the society, as recorded in May, 1840, were:

William C. Whitridge, New Bedford	President
Peter Mackie, Wareham	Vice-President
Amory Glazier, Fall River	Vice-President
Samuel Sawyer, Fairhaven	Secretary
Paul Spooner, New Bedford	Treasurer
William R. Wells, New Bedford	Librarian

Ten years later, June 20, 1849, the Bristol North District Medical Society was organized to include all fellows of the Massachusetts Medical Society residing in Taunton, Seekonk, Attleboro, Rehoboth, Norton, Mansfield, Easton, Raynham, Berkley, Freetown, Somerset, Dighton and Swansea.

When the state line was changed in 1862, nearly all of Pawtucket and a part of Seekonk were attached to Rhode Island, and members of those places afterward became known as non-resident fellows of the Massachusetts Medical Society.

A glance at the medical history of the State shows that many prominent physicians were practicing before the founding of the Massachusetts Medical Society and before that of the Bristol South District Medical Society.

Before 1800 the medical news and literature from New Bedford emanated mostly from Ebenezer Perry, the only physician of the town. About

the year 1795 his charge for a visit was sixpence, and thus he kept all other physicians at a distance. An English lady who was under treatment at this time was so much surprised at the meagerness of his charges that she asked to be furnished with the particulars of the bill, so that she might take it to England. After this, the doctor raised his price to one shilling per visit. It is said that Dr. Perry was a good, plain, practical physician, and an honest man, "but poor." Another prominent physician was Elisha Tobey, with whom William Baylies studied before he began his own practice in Taunton. Samuel Perry and his son, Samuel, were early practitioners.

The early members of the Bristol South District Medical Society who practiced in New Bedford were: Samuel Perry, 1803; Alexander Read, 1816; Paul Spooner, 1821; William C. Whitridge, 1822; Andrew Mackie, 1824; Julius S. Mayhew, 1830; Lyman Bartlett, 1833; William A. Gordon, 1835; Edward W. Greene, 1839; and Elijah Colby, 1847.

Alexander Read, a graduate of Dartmouth in 1808, located in New Bedford in 1811.

Paul Spooner opened an office in New Bedford in 1807 and practiced as a successful obstetrician for half a century. He died in 1862 at the age of seventy-six.

William Cushing Whitridge came to New Bedford in 1822, where he practiced until his death in 1857, aged seventy-four years. He served as the first president of the Bristol South District Medical Society.

Julius Stewart Mayhew came to New Bedford as a young school-teacher and gave singing lessons, then entered Harvard Medical School. He came from a long line of physicians, there having been a doctor in each generation of the Mayhew family for hundreds of years. He joined the Massachusetts Medical Society in 1830, and took an active part in organizing the Bristol South District Medical Society. He was a foe to all types of oppression and among the first to cast an Abolitionist vote in New Bedford. In truth, he was a man of the "old school."

William Alexander Gordon became a fellow of the Massachusetts Medical Society in 1835. He was born in Newburyport and was graduated from Harvard Medical School. He came to New Bedford in 1839, and took an active part in founding the Bristol South District Medical Society.

Elijah Colby came to New Bedford in 1830 and practiced until his death in 1856. He was treating a patient an hour before his own death. It is said that he was never known to speak a cross word in his life.

The medical history of Fall River began somewhat later than that of New Bedford. The inhabitants of the town were forced to rely on physicians in surrounding towns for medical aid. The first doctor of the period was Amory Glazier, who began to practice in 1811.

The early members of the Bristol South District Medical Society who practiced in Fall River were Henry Willard, 1832; Amory Glazier, 1839; Jason H. Archer, 1839; Foster Hooper, 1839; Ebenezer T. Learned, 1839; William H. A. Crary, 1840; Thomas Wilbur, 1841; Phineas W. Leland, 1851; and Jerome Dwelly, 1851.

Henry Willard belonged to the doctor-preacher type.

About 1811, when the population of Fall River was about 1100, Amory Glazier began to practice. He was for some years the only physician in the place. In 1811 he married Ann Chaloner Durfee and lived a long, useful life.

Jason Hawes Archer began to practice about 1820. Born in Wrentham in 1795, he entered Brown University in 1812 and was graduated in 1816. He then studied medicine with William Ingalls, of Boston. In his home was stored the so-called "skeleton in armor," which was destroyed in the fire of 1843.

In 1826, when Fall River's population numbered 2000 souls, Foster Hooper began practicing, after graduating from the Burlington Medical School. He was in the front rank of his profession, and also took an active part in public affairs.

Ebenezer Turell Learned was born in Gardner. He was graduated from Harvard Medical School in 1836, and studied with Perry, Bowditch, Gould and Wyman, of Boston. He practiced for ten years in Weymouth and then attended Jefferson Medical School. He came to Fall River in 1846. Quiet and reserved, he had a vein of humor and a kindly sympathy which made him the ideal family doctor. He retired from practice in 1883 and died two years later at the age of seventy-two. His son and grandson followed his profession and were blessed with many of his virtues.

By 1840, the population of Fall River was 6738. During this year William Henry Allen Crary began practice there. Born in Assonet in 1817, he attended schools in Fall River and academies in Plainfield and Colchester, Connecticut, going on later to the Berkshire Medical School and then to London, Paris and Dublin. At the time of the first trial of ether in Fall River, this anesthetic had been in use for about a year, but physicians were rather slow in adopting it. Hooper and Crary decided to make a personal trial. They went to the office of Ledoyt, a dentist, and

Crary allowed himself to be etherized. Hooper did the administering, but the quantity was not sufficient to produce insensibility to pain, and it had the effect of making Crary decidedly and aggressively nervous. He used his fists, much to the discomfort of Hooper and Ledoyt. Crary married Amy H. White in 1840, and that same year joined the Bristol South District Medical Society. He died at the age of thirty-seven, after a practice of fourteen years.

Thomas Wilbur was born in Hopkinton, Rhode Island. He was graduated from the Yale Medical School in 1824, and studied for a number of years in Philadelphia. He first practiced in Swansea and then came to Fall River. He had seven children. A granddaughter, Dr. Mary W. Marvell, a graduate of Johns Hopkins, is now a physician in Fall River. Wilbur was admitted to the Bristol South District Medical Society in 1841. He died in Missouri, while on a business trip, at the age of sixty-two years.

Phineas Washington Leland was one of the most resourceful and public-spirited physicians of his time. He was born in Grafton in 1798, and studied medicine with George Cheever Shattuck, of Boston, receiving his degree from Bowdoin in 1826. He was collector of customs in Fall River for twenty years. In 1842 he was elected to the State Senate; as president of the Fall River Athenaeum, editor of the Fall River *Patriot* and one of the founders of the Fall River Public Library, he was greatly interested in educational matters. He was admitted to the Bristol South District Medical Society in 1851. He died in 1870, aged seventy-two, after a practice of thirty-six years.

Jerome Dwelly, although born in 1823, was in active practice in the early years of the present century in Tiverton, Rhode Island. He attended Pierce Academy in Middleboro. He studied medicine with Thomas Wilbur and later with William E. Townsend, of Boston. In 1847 he was graduated from the Harvard Medical School and began to practice immediately. With Crary he gave ether successfully, producing complete anesthesia, operating on the son of Thomas Smith, who had been injured by the handle of a paint brush penetrating the muscles of the back. This was the first successful use of ether in this part of the State. Dwelly was city physician to Fall River from 1855 to 1868 and was medical examiner in this district for more than a generation. He died in 1913 at the age of ninety, after a long, active, faithful practice of sixty-four years.

Bearing in mind our heritage from these great physicians of the past, and the final act of its first president in leaving instructions for his own postmortem examination, may we not do something constructive in commemorating this anniversary in the nature of an act to improve our standards of practice?

Morbid anatomy may be regarded as one of the essential supports of the medical edifice, the chief cornerstone upon which it may repose in security. All its teachings are facts. We must not withdraw from the age-old recognition of the value of truth in daily practice.

To face the truth at the autopsy table is sometimes humiliating, but far greater progress is made in such self-abnegation than by a wealth of conjecture. Let us launch a movement to encourage physicians of this district and others in the Commonwealth to devise ways and means to educate the public as to the value of the postmortem examination.

Therefore, in closing, I venture to offer this resolution:

WHEREAS, Morbid anatomy is the foundation of medical knowledge; and

WHEREAS, The lessons derived therefrom constitute a most powerful postgraduate study; and

WHEREAS, The number of postmortem examinations now obtained both in hospitals and outside is deplorably small; therefore be it

RESOLVED, That the Massachusetts Medical Society appoint a committee to study the subject with a view of petitioning the General Court of the Commonwealth to increase the facilities for postmortem examination by making available the services of one well-trained pathologist in each district of the Massachusetts Medical Society.*

The preparation of this material in the form of annals or chronicles, including biographical references of the early participants in the affairs of the Bristol South District Medical Society, has been time-consuming but not a chore. It so happens that since 1916 I have been in possession of a complete set of the *Transactions* of the Massachusetts Medical Society from 1781 to 1900. A more interesting, informative and stimulating collection of records would be difficult to find.

I found many personal and interesting references from the pamphlet *Early Physicians of Fall River,* by the late Dr. A. C. Peckham, who was recognized as the historian of the medical profession in this district, where he practiced for more than sixty-five years.

The reader who is interested may find further il-

*The above resolution was unanimously adopted.

luminating material in Dr. Henry R. Viets's book, *A Brief History of Medicine in Massachusetts.*

I regret that time does not permit a report on the contemporary history of the Bristol South District Medical Society. No doubt it is familiar to many of our members, and may be presented on some future occasion. Looking back over the period which I have covered in a somewhat cursory manner, it is apparent that this society has continued to flourish with and in the path of the parent society. The medical profession of the State of Massachusetts has maintained its prominent position in the advance of medical knowledge. In no other period in the history of medicine have the prevention and cure of disease made such progress as in the past few decades. In this advancement of medical knowledge the fellows of this society as a whole have contributed in full measure.

151 Rock Street.

REPORT ON MEDICAL PROGRESS

BACTERIAL INFECTIONS OF THE GASTROINTESTINAL TRACT*

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ONE of the major problems in preventive medicine and public health is the control of bacterial diseases of the gastrointestinal tract. It is no exaggeration to say that greater strides have been made in the prevention of these diseases than in any other group of epidemic diseases, with the possible exception of diphtheria. In the Western Hemisphere, at least, the decrease in the number of cases of typhoid fever, infantile diarrhea and dysentery has been brought about through the co-operative activity of physicians, sanitary engineers and public-health officials who have devised methods for protecting the food and water supply of the public and for preventing the spread of infection. In spite of all these advances, we must not allow such victories to give us a sense of false security, since the infections mentioned are still far too common in many communities. It is well, then, to review some of the features of the various infections which aid in their recognition and prevention.

TYPHOID FEVER

The decline in the number of cases of typhoid fever in the last forty years is one of the remarkable achievements in medicine. In most large hospitals, the disease is indeed rare. The survey of the situation by Dublin and Lotka[1] in their recent book, *Twenty-Five Years of Health Progress,* serves to stress certain points. First, it is now clear that typhoid fever is more prevalent in small towns or villages than it is in either strictly rural or urban populations. The explanation for this state of affairs would appear to be the inadequate control of water supply and sewage disposal, as well as a lack of adequate control of carriers and infrequent vaccination.

The recognition of typhoid fever usually causes no difficulties, since the isolation of the typhoid bacillus from the blood, urine or stools or the detection of specific agglutinins in the blood serum of the patient serves to establish the diagnosis. Certain difficulties may arise if typhoid fever develops in a previously inoculated individual or if the disease is very mild. The difficulties in diagnosis in those previously inoculated are most evident in patients who may fail to show bacteremia but who show a positive agglutination test. The question then arises whether the agglutination reaction is evidence in favor of an active infection, or only a reaction to the previous inoculation in a patient with another entirely different infection.

When one is confronted with the problem of fever in an individual who has been previously inoculated against typhoid fever, and who shows a positive agglutination test but no organisms in the blood, urine or stools, the following procedures should be carried out in order to establish whether or not one is dealing with a case of typhoid fever.

Agglutination tests should be carried out with H and O antigens, possibly with Vi antigen, and they should be done serially, that is, once every five to seven days. Since the interpretation of the results of these tests is of considerable importance in diagnosis, it is necessary to be familiar with their significance.

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Agglutinins against the H antigen (flagellar antigen) appear in the blood of vaccinated individuals, and may persist for a number of months following inoculation. Their presence, therefore, in the blood of a patient with suspected typhoid fever who has been inoculated may be of little diagnostic significance unless the titer should increase to 1:500 or 1:1000 as the fever progresses. In some non-inoculated individuals who develop typhoid fever, H antibodies may be absent. For this reason it is always well to use O antigen in the tests as well.

Agglutinins against O antigen (somatic antigen) appear in the circulating blood during active typhoid fever even when H agglutinins are not present. They are present in the blood of previously inoculated individuals much less often than are H agglutinins. Their presence in the circulating blood, then, in a titer of 1:200 or 1:500 is highly suggestive of an active infection.

Agglutinins against Vi antigen (Felix and Pitt's[2] antigen) appear in the blood during an active infection with typhoid bacilli but not in inoculated individuals. It is usually unnecessary to include this antigen in the test, since no case of typhoid fever develops Vi agglutinins without developing H or O agglutinins or both. Its principal use is in testing the blood of vaccinated subjects who are suspected of having typhoid fever and who may show H and O agglutinins owing to previous inoculations.

From this brief discussion, it is obvious that the use of both H and O antigens is helpful in the diagnosis of active typhoid fever in both inoculated and non-inoculated patients. Moreover, a single agglutination test may not be sufficient to establish the diagnosis unless the titer of agglutinins is high (1:500) and the patient has not been inoculated.

One is occasionally confronted with the problem of the patient who has fever without localizing signs of infection and in whom the course of the disease is that of typhoid fever. The blood cultures and agglutination tests are negative. The failure to demonstrate agglutinins in the circulating blood may be due to the failure to use both H and O antigens, or the failure to use enough antigens in the typhoid-salmonella group. It is now established that at least twelve distinct serological types of typhoid-salmonella organisms are capable of producing the clinical picture of enteric fever. Therefore, the failure to detect agglutinins to antigens of the typhoid and paratyphoid A or B bacilli in a patient who shows the clinical picture of enteric fever may be due to the fact that the proper antigen has not been used in the test.

There is now convincing evidence that the incidence of typhoid fever can be reduced by means of prophylactic inoculation. That inoculated subjects may develop typhoid fever there is no doubt. This is especially likely to occur if the infecting dose has been large, the exposure frequent and the time between exposure and inoculation has been over three years. There is also suggestive evidence that inoculation of patients with vaccine which is made from strains which fail to contain an adequate amount of O antigen may afford very little protection. When vaccinating, it is well, then, to be sure that the vaccine is prepared from a smooth, virulent strain. At present, the United States Army is using the "Panama 58" strain for the preparation of vaccine rather than the old "Rawling's" strain, since it has been found that the latter has become degraded and often fails to stimulate adequate antibodies as determined by mouse-protection and other tests.

In short, all persons who are living in or plan to visit areas where typhoid fever is prevalent should be vaccinated against it. The vaccination should be repeated every three years, and the vaccine should be prepared from a smooth, virulent strain of organism.

Acute Food Poisoning Due to Bacterial Invasion or Bacterial Products

Every year, especially in the summer months, physicians encounter cases of acute food poisoning resulting from bacterial infection or its products. Experience has shown that these cases are due either to the toxic products of the killed bacteria or to the combined activity of the living bacteria and their toxic products. Poisonous substances which develop as a result of the growth of bacteria in meat or other food may also play a part.

From numerous studies,[3] it has been shown that food poisoning is usually caused by the salmonella group of organisms, and in the majority of cases *Salmonella aertrycke* and *S. enteritidis* are the most important. Rarely *S. suipestifer* and *Shigella dysenteriae* cause symptoms of acute food poisoning. The foods which are most likely to become infected are meats and fish, — especially when canned, — milk products and, less often, sea food and fruits.

The clinical features of food poisoning are relatively uniform, although they vary greatly in severity and duration. The three cardinal symptoms are abdominal pain, diarrhea and vomiting. The variation in the clinical picture depends on the amount of toxic material ingested and whether or not living bacteria are present as well. In oc-

casional cases, vomiting may be infrequent or absent. In many cases, however, vomiting is very severe and persistent and is the outstanding feature. Indeed, in some epidemics abdominal pain and diarrhea may be entirely absent. In these, nausea and vomiting associated with high fever are the conspicuous features.

For purposes of description, cases of acute food poisoning may be divided into three groups: cases in which the symptoms are purely those of irritation of the gastrointestinal tract without absorption of any toxic substances; cases in which the symptoms are those of a severe gastroenteritis with constitutional symptoms (fever, prostration, cramps and so forth); and cases in which the constitutional symptoms and signs are more protracted and conspicuous than those of the gastroenteritis.

In the first group, the incubation period is short, recovery is rapid and there are no aftereffects. Fever and prostration are absent.

In the second group, the incubation period is about two to four hours after the ingestion of food, the onset is acute and severe, with symptoms of gastroenteritis, and constitutional symptoms, such as fever, prostration and muscle cramps, occur. Very often the acute symptoms disappear within twenty-four to thirty-six hours and recovery is rapid. There is evidence supported by animal experimentation that the acute gastroenteritis is due to the local action of the undestroyed toxins whereas the constitutional symptoms result from their absorption. There is very little to indicate that the symptoms in these cases are due to the ingestion of living bacteria.

In the third group, the symptoms are due to infection with living bacteria as well as to toxins. As a rule, the incubation period is not less than twelve to eighteen hours, the initial symptoms are less acute and abrupt, and the constitutional symptoms are much more striking and protracted.

The precise etiologic diagnosis of bacterial food poisoning may be exceedingly difficult in the cases in which the symptoms are due to the effects of the toxin alone. The examination of excreta for living organisms should be carried out in all cases of suspected food poisoning and, after a week or more, the examination of the blood for specific agglutinins (*S. aertrycke, S. enteritidis, S. suipestifer*) may aid in the etiologic diagnosis. Samples of the suspected food should be obtained and sent to laboratories which are equipped to study these infections by means of both culture and animal experimentation.

The prevention of food poisoning may be difficult, but it is perhaps well to recall that in hot weather all food should be cooked thoroughly; if it is eaten in the cold state, it should be protected from contamination and adequately refrigerated.

Serious infections of the gastrointestinal tract in infants have been described by Schiff[10] as being due to other strains of Salmonella, such as the "Panama" strain. It is important, then, in any case of acute infection of the gastrointestinal tract to study the case from the point of view of salmonella infection.

Dysentery

Bacillary dysentery is still a common disease in the summer months of the year in various parts of the United States. The symptoms and signs vary widely, so that the recognition of mild cases may be exceedingly difficult, unless the possibility is entertained in all cases of diarrhea and appropriate methods are used for detecting the organism in the stools or for studying the blood for specific agglutinins. In a few cases the symptoms and signs of dysentery are not unlike those of acute food poisoning, and blood and mucus fail to appear in the stools in others. The diagnosis is suggested immediately by the presence of mucinosanguineous stools, diarrhea and tenesmus.

The diagnosis of dysentery can be made by isolating the organism from the stools. These should be obtained in their fresh state and cultured as quickly as possible. If there is a delay between the time that the stool is passed and the time it arrives in the laboratory, it is well to preserve it in glycerin, as recommended by Wu and Sia.[4] Their procedure was to use two parts of 50 per cent glycerin and one part of stool. In this way the stools were preserved so that dysentery bacilli could be isolated from them much more readily than when glycerin was not used.

Within recent years, a great many mild cases of dysentery due to the "Sonne" strain have been recognized, especially in New England. Since the infections due to this organism may be mild, they are frequently overlooked and serve as a source for the spread of the infection. Indeed, one of the problems in the control of dysentery is the difficulty in recognizing carriers and mild cases. These sources of infection are frequent and not readily recognized.

Aside from the lesions in the colon, there are other clinical features of bacillary dysentery requiring comment. These are the nonsuppurative complications occurring within fourteen to twenty-one days or longer after the onset of dysentery: arthritis, conjunctivitis and urethritis.

During and following an acute bacillary dysentery, an acute arthritis may be a feature of the illness. Usually it develops during convalescence from the symptoms referable to the intestines, commonly appearing between the tenth and the thirtieth day after the onset of illness. The joints most frequently affected are the knees, hips and those of the hands. With the onset of the arthritis there is fever of indeterminate duration varying from 100 to 102°F., which may continue for three weeks. The local condition of the joints is characterized by pain, tenderness and swelling, limitation of motion and occasional periarticular swelling with involvement of the tendon sheaths. There is normally no redness of the skin, although the surface temperature may be elevated. The fluid is light yellow and slightly turbid, and contains moderate amounts of mucin and between 1000 and 10,000 white blood cells per cubic millimeter, with polymorphonuclear leukocytes predominating. The fluid is invariably sterile, but it may contain agglutinins against the infecting strain of dysentery bacilli. The outlook for complete recovery and normal joint function is excellent, in spite of the fact that symptoms may be severe and continue for as long as two or three months.

Conjunctivitis following dysentery is usually a simple catarrhal inflammation of the conjunctiva, and the exudate never contains dysentery bacilli. The objective signs are conspicuous, and the subjective symptoms may be minimal. In most cases the inflammation subsides after a few days and causes no permanent damage.

The urethritis which has been described by various investigators, especially Schittenhelm and Schlecht,[5] may occur with the arthritis or with conjunctivitis. It may be difficult to distinguish from the urethritis due to gonococcal infection, which is not infrequently accompanied by conjunctivitis. The diagnosis is based on a history of an acute bacillary dysentery followed by an arthritis of the larger joints, with sterile synovial effusion, from which complete recovery occurs. When the arthritis is accompanied by a conjunctivitis, iritis or urethritis, such as was observed in numerous cases by Schittenhelm and Schlecht during the World War, the discrimination between dysenteric and gonorrheal arthritis may be difficult. The bacteriological examination of the stools and of the urethral secretion, together with the history, should make such a differentiation more certain.

Suipestifer Infections

Within the last few years there have been an increasing number of reports of infections due to *S. suipestifer,* and excellent reviews of the subject have been made by Harvey,[6] Kuttner and Zepp[7] and Cohen, Fink and Gray.[8] This organism is also known as the bacillus of hog cholera, and for a time, before the true nature of hog cholera was known, it was considered to be the etiologic agent of the disease. The normal habitat of the organism is in swine, but it may produce infection in man by infecting food such as pork, ham, sausage, milk, tapioca pudding, ice cream, crab meat or veal. So far as is known, the organism enters the body via the gastrointestinal tract and produces symptoms of fever without localizing signs of infection, of fever with foci of infection in various organs or of acute food poisoning.

Infections with this organism occur sporadically and not in epidemic form. For this reason, it is frequently impossible to trace the source of infection or to prove that the infection was caused by eating infected food. One is especially likely to observe such cases following surgical operations or during the course of debilitating diseases. Many of the cases described have occurred in children. The mortality increases with age, so that under twenty-five years of age it is about 20 per cent, whereas over twenty-five it is in the neighborhood of 60 per cent.

In from 50 to 60 per cent of cases of infection by *S. suipestifer* the outstanding feature of the illness is fever without localizing signs of infection. The diagnosis in such cases is made by isolating the organism from the circulating blood, stools or urine or by detecting specific agglutinins in the circulating blood. In some cases, positive agglutination reactions in the blood do not appear for three to five weeks following the onset of the infection, so that the diagnosis may be missed if repeated tests are not done.

Metastatic foci of infection due to *S. suipestifer* organisms are not infrequent following bacteremia.[6-9] The common areas involved are the lungs (33 per cent), the joints (15 per cent) and the bones (5 per cent), the respective lesions being pneumonia, arthritis and osteomyelitis. Other less common lesions are pyelonephritis, abscess of the spleen, cholecystitis, meningitis, pericarditis and pleural effusion.

Staphylococcal Infections

Following the ingestion of food which has become contaminated with *Staphylococcus aureus,* the symptoms of acute food poisoning, namely nausea, vomiting and diarrhea, may occur. These organisms have been isolated from cakes and pastries (filling in chocolate éclairs, cream puffs and so forth), and it has been demonstrated conclusively[11] that the acute symptoms are due to the

action of toxins which are produced by the growth of organisms. The infections usually occur in localized outbreaks, and the symptoms begin within a few hours, usually two to three, after the ingestion of the infected food. The diagnosis can be made by isolating staphylococci from the suspected food. Recovery is usually complete, except for rare fatal cases in which abscesses of the intestinal wall occur.[12] It is perhaps well worth remembering that not all strains of *Staph. aureus* produce toxin which is capable of causing acute gastroenteritis, so that the mere finding of these organisms in food does not necessarily mean that they are the cause of the infection. A careful search for other organisms should also be made.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor*

CASE 26031

PRESENTATION OF CASE

First Admission. A forty-one-year-old woman was admitted to the hospital complaining of headaches of three months' duration.

Seven years before admission the patient apparently suffered from some form of "shock," which left her with a "paralyzed" left leg and arm for about three months. The left eye was similarly involved in this paralysis, although the exact nature of the involvement could not be determined. There were associated headaches which were made worse by emotional stress and excitement. She recovered from these complaints in three months and was well for over six years until three months before admission when she again experienced generalized headaches and pain behind both eyes, with associated vertigo. These symptoms became worse during times of stress and excitement and were occasionally associated with vomiting.

Physical examination revealed an obese woman in no apparent discomfort who, however, complained of intermittent headaches. Examination of the heart, lungs and abdomen was negative. The blood pressure was 100 systolic, 65 diastolic. The pupils were round and regular, but the right was larger than the left; both reacted slightly and sluggishly to light, but equally and actively to accommodation. There was slight choking of both optic disks. The whole left side, that is, the shoulder, elbow, knee and ankle muscle groups, seemed slightly weaker than the right. Orientation, cooperation and memory were apparently normal. Attention was poor. The remainder of the neurological examination was negative.

The temperature, pulse and respirations were normal.

Examination of the blood revealed a red-cell count of 5,500,000 with a hemoglobin of 80 per cent, and a white-cell count of 6500 with 58 per cent polymorphonuclears; the stained smear was normal. The urine was negative. The blood Hinton and Wassermann tests were negative. A lumbar puncture showed an initial pressure of 230 mm. of water, which responded well to jugular compression; the total protein was 36 mg. per 100 cc., and the sugar 65.3 mg.; the fluid contained 3 lymphocytes per cubic millimeter, and the Wassermann and gold-sol tests were negative. Roentgenograms of the skull were negative. An encephalogram was unsatisfactory.

The patient remained in the hospital for about three weeks for observation. Her headaches persisted. She was discharged unimproved.

Second Admission (two months later). It was stated that the history was almost of negligible value because of language and "mental" difficulties. It was thought that she probably had had constant headaches since her discharge. She had non-projectile vomiting a few times, and was admitted because of a continuation of the symptoms noted on her first admission. Her physical and neurological examinations were unchanged except that there was a bilateral papilledema of 3 diopters, with engorged retinal arteries and veins but no hemorrhages. Her temperature, pulse and respirations were normal, and the blood pressure was 146 systolic, 90 diastolic. Roentgenograms of the nasal sinuses and skull were essentially negative.

On the fourth hospital day a right subtemporal decompression was performed under Avertin-ether anesthesia. The dura was tense, and when it was incised crucially, the brain herniated considerably. There was no local evidence of tumor, but the cortical vessels were unusually large and tortuous and seemed more numerous than under normal conditions. No exploration below the surface was made. The dura was not closed; no bone was replaced; the wound was closed in layers, with the decompression area well filled. She had an uneventful convalescence, seemed somewhat improved and was discharged on the twenty-first postoperative day to be followed in the Out Patient Department.

Six months later she complained of pain in the top and back of the head. The decompression area bulged moderately but was not tense. There was a slight left central facial weakness, and the knee jerks were active, the left greater than the right. There were no other positive findings. She failed to report to the clinic thereafter until she was readmitted to the hospital.

Third Admission (four years later). She complained of periodic exacerbations of headaches in the region of the operative defect, associated with dizziness, vomiting and dimness of vision. These episodes occurred every four to fifteen days and lasted a few days. The physical, laboratory and neurological examinations were negative. The optic disks showed no atrophy or papilledema. The decompression wound was tense but did not

pulsate or bulge. A lumbar puncture showed an initial pressure of 220 mm. of water, which rose to 400 mm. with jugular compression. On removing 2 cc. of spinal fluid the pressure fell to 190 mm., and after 12 cc. had been removed, it was 90 mm. The fluid was clear and colorless and was negative to routine tests. The decompression wound was softer after the lumbar puncture. She was discharged on the seventh hospital day.

Fourth Admission (two years later). She came into the hospital because of vague generalized back and abdominal pains. The physical and neurological examinations were negative, except that her heart was slightly enlarged by x-ray and her blood pressure was 162 systolic, 100 diastolic. Roentgenograms of the dorsal spine showed changes consistent with those of a hypertrophic arthritis; skull plates were negative. She was discharged on the sixteenth hospital day with her condition unchanged.

Final Admission (two years later, fifteen years after her first "shock"). Two hours before her admission the patient was found unconscious on the floor. She had complained of numbness in the fingers the morning before entry. She was busy in the kitchen when, unobserved, she collapsed. Physical examination showed an obese, cyanotic and comatose woman breathing stertorously. The pupils were small but reacted to light. The fundi showed slight papilledema, with hemorrhages and pigmentation. The soft tissues below the old decompression wound were bulging and seemed under considerable tension. No movement of any extremity was noted, but the reflexes, while depressed, were equal. There was no Babinski sign, nor stiff neck. There were numerous coarse rales in the chest, and peripheral edema. Because of the stertorous breathing the heart sounds could not be heard. The blood pressure was 100 systolic, 60 diastolic. The patient failed rapidly, and tracheal rhonchi appeared. The coma persisted, and the temperature rose to 104°F., with increasing pulse and respirations. The systolic blood pressure dropped to 50, and she died about twenty hours after entry. No lumbar puncture was done, but a needle was inserted into the bulging old craniotomy wound without result.

Differential Diagnosis

Dr. Henry R. Viets: This complicated case — and I think it must be complicated and undiagnosable because I have even been given the complete hospital record to read — began when the patient was thirty-four, with "paralysis" lasting three months on the left side, presumably due to a right-sided brain lesion, which was probably on a vascular basis. Seven years later she came in and there was still evidence of weakness on the left side, but no true hemiparesis or hemiplegia. She had begun to show signs of increased intracranial pressure, and we find that there was some confirmatory evidence on lumbar puncture. The initial pressure was 230 mm. of water; otherwise the cerebrospinal fluid was negative. X-ray study did not help in the diagnosis; the encephalograms, unfortunately, were unsatisfactory. The latter might have been of help in throwing some light on the nature of the lesion. One presumes that the diagnosis of a brain tumor, a right-sided lesion in the parietal region, was suspected, but there was not enough evidence to justify operation.

She came in again within two months with more symptoms: constant headache and bilateral papilledema of 3 diopters, with engorgement of the retinal arteries. The diagnosis seems clearer than ever of increased intracranial pressure on a neoplastic basis, but again the lesion did not appear to the physicians in the hospital to be local. They did subtemporal decompression. The vessels were unusually large and tortuous and seemed more numerous than normal. In spite of the fact that the surgeons were looking through an opening not much larger than a silver dollar, an abnormality of the blood vessels on that side was observed. That is the side on which one would suspect the lesion to be.

She improved, but six months later was seen in the Out Patient Department with a bulging of the decompression and a little evidence of left facial paralysis; the reflexes were somewhat greater on the left side. In other words, the lesion was presumably increasing in size, or the findings were the result of operative interference.

Four years later she came back with more headaches, but this time she also had dizziness, vomiting and dimness of vision. They found no increased pressure by ophthalmoscopic examination and no atrophy of the disks. The decompression was tense, and the lumbar puncture still showed increased pressure (220 mm.); the decompression wound was softened as a result of the lumbar puncture. All we can say is that we continue to think that she had an intracranial lesion which resulted in increased intracranial pressure. We do not know anything more about its character or exact localization. At this period of observation there was presumably a decrease in the intracranial pressure, and one is inclined to state that the lesion was probably not a growing neoplasm. A new growth would have continued to increase the pressure, but something had happened and the symptoms had definitely decreased

in intensity. Then we turn back to the operation and recall the changes in the blood vessels. We begin to consider the possibility of a blood-vessel tumor rather than a solid neoplasm, such as meningioma or glioma.

On the fourth admission we have a little additional evidence that helps — provided the diagnosis of a blood-vessel tumor is ultimately going to prove to be correct — in that the heart had become enlarged. It is known that certain types of angiomas increase blood flow and may lead to secondary enlargement of the heart.

By the time of the final admission she had become extremely ill and died shortly after entry. Nothing from the record helps much except that she had had some sort of unconscious attack, had fallen on the floor, had gone into coma and died. The neurological examination did not throw any additional light on the diagnosis.

We have then, in summary, a patient whose symptoms began at thirty-four and who died at forty-nine. There is evidence that she had intracranial disease, and there is some evidence that the intracranial disease was on the right side of the brain in the parietal region. Evidence of increased intracranial pressure was present at times, and this pressure was only slightly, if at all, increased at other times. The course varied and was not definitely progressive; it was certainly not one that is usually associated with an ordinary type of brain tumor.

It seems likely that in spite of the five admissions to the hospital a definite clinical diagnosis was not made. Even from going over the record here, one gets the impression that no diagnosis can be made. It is presumptive of me to suggest a diagnosis, but I think I shall, in view of the fact that we ought to reach some conclusion even if we are wrong. I think that the patient had an angioma of some type.

There are a number of kinds of angioma. The commonest type perhaps is a hemangioma or an angioblastoma, which is usually in the cerebellum and not in the cerebrum. This is a true tumor, presumably the type described by Lindau,[1] associated with cysts in the cerebellum and occasionally in the cerebrum and with von Hipple's disease of the eye, cysts in the pancreas and so forth. That type of blood-vessel tumor is fairly well known, and we have had a number of examples here in the hospital. It is my belief that this patient did not have a true hemangioma, largely because of the facts that this type of tumor is familial and hereditary, that it practically always begins in the cerebellum and that it is associated with cysts and hemangiomas of the eye and elsewhere.

There are two other possibilities of angiomatous tumors. One is the cavernous hemangioma. This is quite possible here. I am not sure that it is the best choice. It usually does not have any definite connection with the meninges, being situated in the white matter, and consists of tumors of the blood vessels themselves, which tend to form cysts. I should rather favor a third type of tumor — an angiomatous malformation or congenital angioma.

If this diagnosis proves correct, is the lesion primarily venous or arterial or both? If it were venous one would not expect choked disks. Furthermore, ordinary venous angiomas of the brain are commonly associated with facial nevi and other venous changes in the skin which this patient did not have, so far as the record goes. In addition, they are often associated with epilepsy, which this patient did not have, unless the first "shock" was an epileptic attack, and are not often complicated by cardiac hypertrophy. A better diagnosis would perhaps be an unusual type of congenital malformation of the arteries of the brain, which is ordinarily associated with choked disks. This type of tumor causes secondary cardiac hypertrophy; there may even be enlargement of the aorta. But we miss one very important point here, if the diagnosis is correct — there is no description of a bruit. A bruit should be heard in most cases of this rare type of angiomatous tumor, but it may not even have been listened for. If one had been noted it would have helped enormously in diagnosis. Also, increased vascularity of the skull was not mentioned — that too would have helped.

I am very doubtful about the diagnosis, but I should think that my best guess would be that, because of the duration of the symptoms, the remissions and the observations at the time of the decompression, this is an angiomatous tumor. This congenital type of angioma is confined, at least in part, to the right side of the brain and is more likely to be arterial then venous.

I should not be a bit surprised if some other diagnosis were made by the pathologist. What could it be? A slowly growing meningioma seems unlikely on account of the course. I think it might be a rare type, possibly a slowly growing glioma, with hemorrhage into it to begin the long train of symptoms. This seems less likely to me than a vascular tumor; therefore I shall stick to congenital hemangioma.

DR. TRACY B. MALLORY: Dr. Ayer, would you like to comment?

DR. JAMES B. AYER: I hoped you would not call on me in this difficult case. I did not know the patient, and I do not know the diagnosis. Obviously we must be dealing with an intracranial

lesion producing an intermittent course over a period of fifteen years. There are very few tumors that can do this, although slowly growing ones have been shown to run a period even longer. Dr. Viets has elected one that may so act. I also suggest the possibility of a cholesteatoma, which may run a long course with intermittently progressive symptoms. Aside from tumors, we should not forget collections of cerebrospinal fluid which go under various names — serous meningitis, edema and so forth — and which not infrequently give a high degree of choked disks and symptoms of brain tumor, frequently without localizing signs. A group of these cases has been described by Dandy[2]; some improved with decompression, others without. Putting the whole case together, I should agree that Dr. Viets has picked the most plausible diagnosis.

DR. WYMAN RICHARDSON: Would one not have to consider simple aneurysm at the base of the brain?

DR. MALLORY: Do you care to answer that, Dr. Viets?

DR. VIETS: There is no evidence that she had bleeding into the cerebrospinal fluid or any involvement of the extraocular muscles or nerves, which are common in aneurysm. An aneurysm is, of course, a possibility, but the choking of the disks and the receding of the choking are against the diagnosis. She did not have any sudden episode except the final one.

DR. RICHARDSON: The first episode was sudden.

DR. VIETS: Possibly, provided the history is accurate. After all, these blood vessel tumors and aneurysms are difficult to differentiate, not only clinically but even pathologically.

CLINICAL DIAGNOSES

Cerebral hemorrhage.
Bronchopneumonia.
Pulmonary edema.

DR. VIETS'S DIAGNOSES

Brain tumor, angiomatous malformation.
Cardiac hypertrophy, secondary.

ANATOMICAL DIAGNOSIS

Cavernous hemangioma, probably congenital.

PATHOLOGICAL DISCUSSION

DR. CHARLES S. KUBIK: I congratulate Dr. Viets. We did not suppose when this case was selected for discussion that anybody would be likely to make a correct diagnosis, but thought it ought to be taken up because the patient had been observed for a long time and presented an interesting and puzzling clinical picture. As Dr. Ayer has said, we see cases every now and again of increased intracranial pressure with spontaneous remission of symptoms in which the diagnosis remains doubtful. Here we have an example of one condition which can behave in that way.

At autopsy there was a cavity filled with about 25 cc. of brownish-red, hemorrhagic fluid outside the dura at the site of the old right temporal exploration. Microscopical examination disclosed an angiomatous formation of large thin-walled blood vessels, with old and recent hemorrhages in the surrounding tissues. There were also small clusters of similar vessels in the subarachnoid space in other places, and most of the superficial cerebral veins were enlarged and tortuous. There was old hemorrhage in one of these angiomatous lesions situated in the left Sylvian fissure. There were numerous connecting branches between the abnormal vessels and veins, but no connection with arteries could be demonstrated. I should suppose that these lesions represent developmental anomalies and not true neoplasms. They may increase in size somewhat through enlargement of existing small vessels, which are usually very numerous. Hemorrhages probably explain the acute episodes.

DR. VIETS: Was there any hypertrophy of the heart or aorta?

DR. KUBIK: The autopsy was restricted to the head.

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CASE 26032

PRESENTATION OF CASE

A sixty-four-year-old businessman was admitted complaining of regurgitation of food.

Ten years before entry, after eating fish chowder, the patient became ill for a period of three days with nausea and vomiting. Ever since he had been troubled by a varying degree of regurgitation of liquids and less frequently of solid foods. This generally occurred at night after he had been in bed for two or three hours and rarely occurred during the day. Fluid always came up easily without nausea or effort and did not seem to come from the stomach. There was no blood. Regurgitation consisted of about a mouthful at a time and gradually progressed to the point where it occurred each night but caused no outstanding discomfort. Four or five years before entry he undertook a course of physical exercise, Swedish massage and self-imposed diet which caused his weight to decrease from 193 to 174 pounds. These meas-

ures had been adopted because the patient had felt under par and had been quite dyspneic with exertion. Subsequently he was very much relieved, although the regurgitation continued. One year before entry he had a slight cough productive of watery sputum. Although the acute phase persisted for only two or three days the productive cough continued throughout the entire winter. Four months before entry he contracted another cold and discovered that he had lost about 15 pounds during the preceding month. Regurgitation became slightly more frequent, and he developed a cough productive of about a pint of watery frothy sputum daily. There was never any blood or grossly purulent or fetid material in the sputum. At about that time there was an afternoon rise in temperature to 100 or 101°F., and both the cough and fever continued until entry. There was some constipation, and the patient was troubled by hemorrhoids. His appetite became quite poor. Cold liquids caused immediate regurgitation, but hot liquids did not. He frequently regurgitated brownish salty liquid in the morning on waking. Two months before entry he was confined to bed for four weeks because of afternoon fever and a physician told him there was consolidation of the left lower lobe, which cleared up in a week or two. Associated with this illness during the few months before entry there was some hoarseness, which varied in intensity, and the cough gradually became brassy in character. X-ray examination four and a half months before entry showed a soft-tissue mass behind the middle portion of the heart in the posterior mediastinum. This was almost round in shape and produced a pressure defect in the medial aspect of the lower esophagus, which was adherent to the mass. Barium entered the region of this mass through a 2-cm. opening from the esophagus and filled a fairly round cavity, within which were large filling defects, particularly at its lower posterior portion. Some of the barium flowed from this cavity into a more irregular one in the lateral part of the soft-tissue mass, and from there, small quantities trickled through a minute opening into one of the minor bronchi of the left lower lobe. The remainder of the gastrointestinal tract showed no evidence of disease. There was no obstruction in the esophagus. Examination of the chest showed normal diaphragmatic position and movement. There was incomplete aeration in the medial part of the left lower lobe, and some questionable dilatation of the bronchi in this region. There was no shift of the mediastinum.

Physical examination showed a well-developed but poorly nourished man who appeared to have lost considerable weight. Examination of the mouth and pharynx was negative. There was slight pallor of the mucous membranes. The maximum apex impulse of the heart appeared to be slightly displaced toward the midline, although the position was not stated. The sounds were regular and of good quality. No murmurs were heard. The blood pressure was 105 systolic, 60 diastolic. The lungs were clear and resonant anteriorly. In the lower third of the left chest posteriorly there were fine crepitant rales and slight dullness with moderate diminution in intensity of the breath sounds.

The temperature was 97.6°F., the pulse 104, and the respirations 32.

Examination of the urine was negative. The blood showed a red-cell count of 4,600,000 with a hemoglobin of 70 per cent, and a white-cell count of 14,500 with 83 per cent polymorphonuclears. A single sputum specimen was copious, thin and watery; no blood was present, and examination for tubercle bacilli was negative. Several stool specimens gave negative reactions to the guaiac test. A blood Hinton test was negative.

X-ray examination showed that the soft-tissue mass previously described in the lower end of the esophagus had slightly increased in size. Ulceration within it had extended considerably and reached almost to its lateral wall. The cavity was connected with the lower end of the esophagus, but no barium could be observed to enter into the bronchial tree. The pressure defect in the esophagus was more marked, and there was delay, but no definite stenosis, at the lower end of the esophagus. The appearance of the left lower lung field had not changed appreciably since the last observation.

During the patient's stay in the hospital he remained afebrile and moderately comfortable. Each day he brought up 200 to 300 cc. of thin, watery, frothy sputum, which at times was slightly blood tinged. He had no pain. While in the hospital, pneumothorax was produced artificially in the left pleural cavity, and on four occasions 400, 600, 800 and 700 cc. of air were introduced. The intrapleural pressure remained negative. The patient's sputum decreased considerably in amount after this, and he seemed to cough much less.

After discharge from the hospital the patient's condition gradually grew worse, with brief periods of temporary improvement. His cough increased in frequency and productivity, and he lost strength and appetite. He continued to be able to get down a fair amount of liquid food, however, although he vomited about twice daily. The vomitus consisted of watery material and

mucus but no occult blood and varied from a quart to a quart and a half in amount. His weight decreased about 2 to 4 pounds each week and, at the time of his death, had dropped to about 70 pounds. For two months he was unable to rise from bed and for the last two weeks unable to swallow anything. He died five and a half months after his discharge, about ten and a half years after the onset of his illness.

Differential Diagnosis

Dr. Allen G. Brailey: The diagnostic problem in this case has to do with the nature of the mediastinal mass. The earliest symptom which may have been related to this mass was regurgitation, which began ten years before entry, when the patient was fifty-four years old, and which persisted to the end. The next symptom which may throw light on the nature of the mass was slight cough, which began one year before entry. Then, four months before entry, the patient discovered that he had lost 15 pounds of weight and that he had a little fever. He became constipated and lost his appetite. From then on his course was steadily downhill. In the hospital he was found to have consolidation of the lower lobe of the left lung, which was promptly explained by the demonstration of a fistulous tract between the lower esophagus and the left lower bronchus.

Fistulas between the esophagus and a bronchus or the esophagus and the trachea are usually due to carcinoma. Less often they are caused by tuberculosis, and rarely they represent minor developmental defects, not incompatible with life. In this case there was no evidence of fistula prior to one year before death, and nothing to suggest tuberculosis. Apparently the sputum was examined only once for tubercle bacilli; none were found, and I think there is very little likelihood that this fistulous tract was due to tuberculosis. On the other hand his progressive downhill course, his rapid loss of weight and the ragged, irregular appearance of the tract by x-ray are at least consistent with the symptoms and signs of neoplasm. I believe this fistula extended through cancer tissue and that the cancer probably arose at the esophageal end, where the bulk of the abnormal tissue is shown by x-ray to be situated.

While it seems impossible not to believe that this man had a cancer, nevertheless there are some serious objections to this diagnosis. It does not satisfactorily explain the whole of this ten-year period of disability, for it is not credible that he could have had a cancer of the esophagus ten years before entry to the hospital of sufficient size to cause regurgitation and yet have remained in essentially good health until a few months before death. We are furnished with the suggestion that this difficulty with regurgitation began shortly after a meal of fish chowder. There may be fishbones in fish chowder and one may have lodged in his esophagus. So far as I can find, one of three things may happen to a fishbone so lodged. It may dislodge itself and go on into the stomach. Or it may require removal by esophagoscopy. Or it may penetrate the esophagus and set up an acute mediastinitis. But it could never cause the chronic symptoms of mild obstruction such as occurred here over a nine-year period. Partial stricture of the esophagus could have caused this long history of regurgitation and have provided the nidus for the later development of cancer. This is a real possibility and I cannot rule it out, but it is subject to the objection that we know of no cause for such a stricture, such as the swallowing of caustics. If it was a congenital stricture, why did he have no symptoms prior to fifty years of age?

There remains another possibility; namely, that the patient may have had a diverticulum of the esophagus. On studying the x-ray plates it is easy to follow a rounded outline which would do very well for the as yet undestroyed wall of a large diverticulum. A diverticulum of this size is undoubtedly a pulsion diverticulum since traction diverticula (caused by adhesion with tuberculous lymph nodes) are usually only a few millimeters deep. Those of the pulsion variety are much commoner in the upper esophagus at its junction with the hypopharynx. Their etiology is not wholly settled, but it is thought that they develop at points of congenital weakness in the muscular wall through which the esophageal mucosa gradually pouches outward. They may enlarge very slowly, and they cause no symptoms until they become so large and empty so poorly that they kink or distort the esophagus. Such kinking pulls the mouth of the diverticulum more and more into line with the esophageal lumen and causes the pouch to fill with increasing ease. Its pull and pressure help to close off the lower portion of the esophagus, and symptoms of obstruction with the regurgitation of recently swallowed food appear.

In conclusion, then, I think that this patient died of carcinoma of the esophagus which had communicated with the left lower bronchus and set up a chronic pneumonitis of the left lower lobe. It is at least a reasonable hypothesis that this cancer arose in an esophageal diverticulum which he had had for years and which had caused symptoms for about ten years.

DR. AUBREY O. HAMPTON: I can add nothing to the x-ray description. Dr. Brailey has made the same interpretation on the x-ray films as we did. Stricture of the esophagus is ruled out by the absence of obstruction to the flow of barium. Food particles in a diverticulum can also be ruled out because the filling defect did not shift in position or change much in shape. The small fistulous tract demonstrated at the first examination is seen on only one or two of the films. Only a very thin, thread-like stream of barium passed into one or two of the smaller bronchi, and this was not present on the second examination. The opening from the esophagus into the large rounded cavity is quite typical of that of a diverticulum.

CLINICAL DIAGNOSIS

Carcinoma arising in diverticulum of esophagus.

DR. BRAILEY'S DIAGNOSES

Carcinoma of esophageal diverticulum, with invasion of left lower bronchus.
Tracheobronchial fistula.
Chronic pneumonitis.

ANATOMICAL DIAGNOSES

Epidermoid carcinoma of diverticulum of the esophagus, with invasion of hilus of left lung.
Esophageal obstruction.
Emaciation.
Bronchiectasis, right lower lobe, slight.
Pulmonary atelectasis.
Pericarditis, acute fibrinous, localized.
Pleuritis, acute fibrinous, localized.

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY: The autopsy findings bear out almost point for point Dr. Brailey's predictions. We found a large diverticulum of the lower end of the esophagus communicating, through a perfectly smooth opening, with an otherwise normal esophagus. Some little distance from its mouth the walls of the diverticulum became granular, thick and indurated, obviously carcinomatous. Anteriorly the tumor had spread by direct extension into the hilus of the left lung. We were unable at autopsy to demonstrate the bronchial fistula, but the history definitely suggests that this closed some time before his death. The bronchi of the left lower lobe showed moderate but not great dilatation and only moderate inflammatory reaction. I think we must make a diagnosis of bronchiectasis, but I do not believe that the cupfuls of watery sputum which the history mentions could have been raised from these bronchi and it is more probable that the "sputum" represented discharge from the diverticulum through the fistula.

Another point of interest is the question of esophageal obstruction. It is quite clear from the history, as Dr. Brailey pointed out, that for many years after the onset of symptoms of regurgitation there was no obstruction. This only developed in the last year of life. One might easily have guessed that it resulted from extension of the carcinoma to the esophagus proper. This was not the case, however, and the obstruction must have been due either to external pressure or to kinking, as Dr. Brailey suggested.

The tumor was a remarkably well-differentiated, very slowly growing epidermoid carcinoma, certainly not above Grade I in malignancy. It is probable that it had been present much longer than the acute symptoms would indicate. Despite its extension into the hilar tissues it had not metastasized even to the regional bronchial and mediastinal nodes.

Except for incipient terminal pericarditis and pleuritis there were no other anatomical findings of significance.

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MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

At the call of Dr. Lemuel F. Woodward, then chairman of the Worcester Board of Health, thirty-five men representing the State Board of Health and twenty-four local boards gathered at the old Revere House in Boston, on January 11, 1890, and officially organized the Massachusetts Association of Boards of Health. They elected as their first president Dr. Henry P. Walcott, chairman of the State Board of Health, and as first vice-president Dr. Samuel H. Durgin, chairman of the Boston Department of Health. This was the second state association formed in America, New Jersey being first, and its fiftieth anniversary, to be celebrated on January 27, is a significant occasion.

The date, 1890, in many respects marks the division between the old and the new in public-health practices. Bacteriology had become a well-established science with its several specialized applications in medicine, sanitation, agriculture and industry; the causes of many of the important epidemic diseases had been discovered; the basic principles of immunity were being formulated; and the bacteriology of water, sewage and milk was being developed. The Massachusetts Drainage Commission, consisting of such men as Hiram F. Mills, William T. Sedgwick, Thomas M. Drown, Allen Hazen and Edwin O. Jordan, was particularly influential in this latter field, while at the Massachusetts Institute of Technology some of the earliest work on the bacteriology of milk was being done.

It was, therefore, most fitting that at just this time a few people with vision saw the value and importance of forming an association of persons engaged in public-health work who could discuss together matters of sanitary interest, who would formulate and enforce legislation, and who could, through their professional relations, come to know one another and to exchange ideas regarding the mutual problems they met as local health officers or board members.

The association soon invited persons of less exclusive administrative interests but of a wide training and vision to join with them, and the early roster of membership included Charles V. Chapin, Samuel C. Prescott, C.-E. A. Winslow, George C. Whipple, Dr. Theobald Smith, Dr. Hibbert W. Hill, Dr. Milton J. Rosenau and others whose names are well known in the annals of public-health progress. These men brought to the meetings a breadth of scientific knowledge and training which immediately gave progressive leadership to the group.

Each important forward step in public health during the past fifty years gained impetus through the meetings of the association. The subjects considered dealt with live current problems, and the speakers were usually leaders in their fields. One can trace in the proceedings the campaign for safe milk, including the early work done on bacteriological examination, epidemiological studies proving the importance of milk in the spreading of disease, the practice of pasteurization and the supporting legislation to bring about more ade-

quate milk control. Professor Sedgwick was the leader in these discussions, ably supported by Dr. Smith and Chapin. Every step in the control of diphtheria, from the value of laboratory examinations as aids in diagnosis to the most recent immunization practices, is reflected in the records. Without the medium of the association for discussing and urging the successive steps in the use of antitoxin and in active immunization with toxin-antitoxin mixtures and then toxoid, we may fairly assume that there would have been more lag between knowledge and application. Chapin's advanced thinking on the importance of contact infection and the uselessness of terminal fumigation is apparent in the records. "It is personal rather than municipal cleanliness that health officers must teach," he insisted.

The association began the publication of a quarterly journal, known as the *Journal of the Massachusetts Association of Boards of Health*, in 1901. This daring and ambitious undertaking was justified, for it was the parent of the present *American Journal of Public Health*, the official organ of the American Public Health Association. The transfer took place in a series of steps and was completed in 1911, when the name of the state association disappeared from the title. Dr. Hill and Burt R. Rickards were the first managers and editors of the journal, and Rickards continued for five years as managing editor of what was then called the *Journal of the American Public Health Association*.

The first twenty-five years of the history are the most spectacular because of the extraordinary events that were happening in the field of public health. However, the association has continued to have the same general significance down to the present time. In 1933, a new constitution was drawn up by a committee of which Dr. George H. Bigelow was chairman. The reorganization provided for three sections: a health-officers' section, a laboratory section and a child-hygiene section. In 1936, the name was changed to the more appropriate Massachusetts Public Health Association.

The association will undoubtedly accomplish as much during the next fifty years as it has in the past fifty years. There is still much to be done in advancing the well-being and comfort of the people and in preventing and alleviating sickness. The more spectacular things may have been achieved, but there remains the necessity of eternal vigilance in all measures concerning sanitation and preventive medicine, and there is the same call for leadership and co-operation as there was in 1890.

COMMUNITY FUND CAMPAIGN

Most local physicians are well acquainted with the vital community services that are made possible by Greater Boston's Community Fund. They know that the various agencies supported by the Community Fund carry on work for humanity which must be done — and that if this work is to be accomplished the annual campaign must be successful.

It is significant that every year the scope of the Fund has broadened. In 1940 more than one hundred and seventy-five hospitals and health and social-service agencies will have Community Fund support, as compared with one hundred and fifty last year, and the campaign will cover Boston and forty-five surrounding cities and towns.

The 1940 goal is $4,625,000. Though this is $125,000 more than has ever before been raised, it represents the absolute minimum required to carry on the vital human services through the year. In order to attain — and, if possible, to exceed — this goal, the time and effort of more than sixteen thousand unpaid volunteer workers have been enlisted. Among them are leading business and professional men and women from all walks of community life.

The 1940 quota for the Physicians' Group is $21,000. Since the 1940 goal, however, is set to meet only the barest minimum requirements, every quota must be oversubscribed. The physicians have regularly done more than their share in the past and, with their first-hand knowledge of human needs, they will probably repeat during this campaign, which extends from January 22 through February 6.

Chairman of the Physicians' Group is Dr. Theodore L. Badger. He is assisted by the following vice-chairmen: Dr. Perry C. Baird, Jr., Dr. Ran-

dolph K. Byers, Dr. Earle M. Chapman, Dr. E. Stanley Emery, Jr., Dr. Thomas H. Ham, Dr. Alfred O. Ludwig, Dr. Archie A. Abrams, Dr. Lendon Snedeker, Dr. William B. Stevens and Dr. Conrad Wesselhoeft. It is also of interest that a member of the medical profession, Dr. Thomas R. Goethals, is the 1940 chairman of the Professional Division.

The theme of the 1940 Community Fund Campaign is built around the life and ideals of Abraham Lincoln, which were typical of this great enterprise "by the people" and "for the people" of Greater Boston. Its purpose is to "teach hope to all, despair to none" of the three hundred thousand people who need help each year. The fullest support of all physicians and other public-spirited men and women in Greater Boston is vital to the 1940 Community Fund Campaign.

MEDICAL EPONYM

Arthus Phenomenon

Maurice Arthus read a paper at a meeting of the Biological Society in Marseilles on June 16, 1903, entitled "Injections Répétées de Sérum de Cheval chez le Lapin [Repeated Injections of Horse Serum in the Rabbit]." This was published in the *Comptes rendus hebdomadaires des séances et mémoires de la Société de biologie* (**55**: 817–820, 1903). The translation of a portion of the paper is as follows:

> If sterile horse serum (our experiments were made with antitoxic serums) is injected under the skin, into the peritoneum or into the veins of a rabbit, whether the serum be fresh or preserved, heated to 57°C. or not heated, no primary or late injury will be produced. Horse serum is not toxic for rabbits. If, after an interval of a few days, this injection of horse serum is repeated, one may state that after several injections, it will produce, even in small doses, injuries which are mild or severe according to the degree of preparation of the animal and which, according to the route of introduction, may be either local or general, immediate or delayed. Horse serum is toxic for rabbits which have been rendered anaphylactic by and to horse serum. . . .
>
> Does the human being develop a similar anaphylactic state with local or general injuries similar to those described in the rabbit, under the influence of repeated injections of serum?

Quoting instances of apparent reactions of this type in human beings, the author concludes that such a state does exist, a conclusion which the observations of others have confirmed.

R. W. B.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY*

Raymond S. Titus, M.D., *Secretary*
330 Dartmouth Street
Boston

Fatal Puerperal Sepsis Following Forceps Delivery

Mrs. J. B., a twenty-seven-year-old primipara, was admitted to the hospital February 1, 1912, in active labor. The expected date of confinement was February 8, the last menstrual period having ceased May 1, 1911. The past and family histories were not recorded.

Examination on entry revealed a vertex presentation in an ODP position. The pelvic measurements were normal. The head was engaged. The temperature was 98°F., and the pulse 80.

After nineteen hours of labor the cervix became fully dilated. Because of lack of further progress a forceps delivery was performed. The patient was anesthetized with ether. After manual rotation of the baby's head, the forceps was applied as for an ODA position. Moderate difficulty was experienced in pulling the head down onto the perineum. Although the color of the baby was normal at birth, it did not breathe and all attempts at resuscitation failed. The mother's condition after delivery was excellent. A one-degree laceration of the perineum was sutured with silk-worm gut.

On February 4, forty hours after delivery, the patient's temperature rose to 102.8°F., and the pulse to 120. The temperature remained elevated throughout the day and at 9 p. m. the pulse rate was 130. There were marked tenderness and spasm on both sides of the uterus. An intrauterine douche of salt solution was given, followed by one of alcohol. She was placed in Fowler's position, and ice-caps were applied to the lower abdomen.

The following day the patient's general condition was definitely worse. There were marked tenderness and spasm throughout the lower abdomen. Distention was somewhat relieved by enemas, turpentine stupes and flaxseed poultices.

The patient rapidly failed. Abdominal distention increased, and there was suggestive intra-abdominal fluid. The pulse rose to 160, and the respirations to 50. A throat culture revealed streptococci and staphylococci. Uterine and blood cultures were not taken. She lapsed into coma and

*A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

died on the tenth postpartum day. An autopsy was not obtained. The discharge diagnoses were streptococcal tonsillitis, general peritonitis and septicemia.

Comment. This septic case is characteristic of those which occur during hospital epidemics. Only one patient of the next five who were delivered escaped the infection, and one of these, the fifth, also died. Strict isolation is the only way to treat this type of puerperal infection. If this cannot be obtained, further admissions to the hospital should be canceled.

The routine treatment in 1912 was intrauterine douches, with or without curettage. In this case no curettage was performed. Douches have no effect on a generalized infection, and they are never used today. It is perfectly possible that, if sulfanilamide had been known and used, this patient might not have succumbed.

ANNUAL PRIZE FOR INTERNS

The attention of interns in Massachusetts hospitals is called to the fact that a prize of $50.00 has been offered by the Massachusetts Medical Society for the best written and most comprehensive case report submitted by one of their number holding an internship in any Massachusetts hospital which is approved by the American Medical Association for intern training during 1938-1940.

This report is to be typewritten, and when completed is to be sealed, unsigned, in a plain envelope, which in turn is to be placed together with a separate slip bearing the name and address of the contestant, in a larger envelope, and sent to: Committee on Medical Education and Medical Diplomas, Massachusetts Medical Society, 8 Fenway, Boston.

The contest this year closes May 5, 1940. Reports may be submitted at any time prior to that date.

DEATHS

BERRY — Charles F. Berry, M.D., of Boston, died October 10, 1939. He was in his sixty-ninth year.

Dr. Berry received degrees from the College of Physicians and Surgeons, Boston, in 1899 and from the College of Physicians and Surgeons, Baltimore, in 1910. He was a member of the Massachusetts Medical Society and the American Medical Association.

LOBO — Jose P. Lobo, M.D., of Providence, Rhode Island, died November 28, 1939. He was in his sixty-third year.

Dr. Lobo received his degree from the Universidade de Lisboa Faculdade de Medicina, Portugal, in 1900.

He was a fellow of the Massachusetts Medical Society and the American Medical Association.

NEW HAMPSHIRE MEDICAL SOCIETY

DEATH

LAKE — Elmer E. Lake, M.D., of Hampstead, died at his home on December 6, 1939. Dr. Lake had practiced in Hampstead for forty-seven years.

He was born in East Haverhill, Massachusetts, December 10, 1861, the son of Morris and Eunice (Duff) Lake, and was graduated from the University of Vermont in 1892. During the World War he served as medical examiner at Fort Preble, Maine, at Camp Eustis, Virginia, at Freeport, Maine and at Fort Williams, Maine, being promoted to a captaincy in February, 1918, which commission he held at the time of his death.

Dr. Lake was a member of the New Hampshire Medical Society and the Rockingham County Medical Society.

He is survived by his widow, Mrs. Mary E. Lake; two sons, Albert C. Lake, of Hampstead, and Morris E. Lake, of Montpelier, Vermont, and a daughter, Mrs. Eunice Sharpe, of Salem, Massachusetts.

Henry H. Amsden, *Necrologist.*

MISCELLANY

GENITAL TUBERCULOSIS

Tuberculosis in the male genital organs is believed to be secondary to some other tuberculous focus in the body, most commonly in the lung. Though the prognosis is discouraging and the treatment far from satisfactory, much progress has been made in this field in recent years. Miller and Lustok published a paper (Genital Tuberculosis. *J. A. M. A.* 113:1388–1394, 1939) based on their observations of 61 male patients with genital tuberculosis, an abstract of which follows.

* * *

At the Sanatorium of the Jewish Consumptives Relief Society, 61 (4.7 per cent) of 1316 male patients admitted in an eleven-year period had genital tuberculosis.

Genital tuberculosis may occur at any age but the vast majority of patients range from twenty to forty years. The younger the patient the more virulent the infection. Genital tuberculosis is secondary to some other tuberculous focus in the body, usually the lungs. Ninety-five per cent of these patients had associated far-advanced pulmonary tuberculosis and 87 per cent had sputum with tubercle bacilli. The infection may reach the genital tract by way of the blood stream, by way of the lymphatics and, secondarily, by continuity of tissue. The seminal vesicles and prostate are the primary seats of the genital tuberculous infection (though the epididymes give more pronounced symptoms) and also the foci from which the bladder and kidneys in many cases are affected.

Pathogenesis

There are two general theories concerning the pathogenesis of tuberculosis of the male genital tract:

1. That the prostate and seminal vesicles are involved primarily in the genital system and that the disease may remain localized or spread as descending genital or ascending renal tuberculosis.
2. That the prostate and seminal vesicles are involved secondarily from other urogenital organs by dissemination through the lumens or walls of hollow viscera connecting them — ascending genital or descending renal tuberculosis.

The authors believe that the disease most frequently starts in the vesicles and prostate but may occasionally start in the epididymes and that the mode of infection is primarily hematogenous.

Diagnosis

The difficulty in accurate diagnosis of the scrotal and prostatic masses has been emphasized frequently, yet the chief underlying cause is incomplete investigation.

The only method available for the examination of the prostate and seminal vesicles is palpation with the finger in the rectum. In the early stages of the disease no change may be demonstrable by this means of examination, but

in the vast majority of cases definite signs are present. Irregular, firm but not stony-hard nodules in the prostate recognized by means of touch indicate extensive involvement of this organ. Likewise when the seminal vesicles are felt as pencil-like bands, extending in an upward and outward direction from the upper margin of the prostate, extensive involvement of these organs is indicated.

Examination of the external genitalia is best done with the patient in a standing position facing the surgeon. Observations are made of alterations in the normal rugose appearance of the skin of the scrotum, the shape of the testicles and their relative position in respect to each other. Changes in the scrotal skin are sometimes a valuable guide, as shown by a smoothing out of the rugae and a wasting of the cellular tissue immediately beneath the dermis. Adhesion of the skin to the epididymis is a well-known sign, as is also a sinus discharging creamy pus. A comparison of the mobility of the two testicles is sometimes helpful. A normal organ can be moved freely within its covering, particularly in the upward and downward direction. This movement is often restricted when tuberculosis of the genital organs is present. In the early stages a soft or even fluctuant mass at the site of the epididymis and involving it is present in a large percentage of cases. If untreated, it will result in ulceration and formation of a chronic sinus discharging pus or it will become a hard fibrotic or calcific mass. Late in the disease the epididymis may entirely lose its identity or, if it can be palpated, will be craggy and nodular. The vas becomes thickened and has beadlike prominences.

Classification

Genital tuberculosis has the same pathological characteristics as tuberculosis elsewhere in the body and a discussion of it must take into consideration the clinicopathological type of tuberculosis, as is done by the phthisiologist in classifying pulmonary tuberculosis. The authors have classified their cases into three groups: catarrhal, 8 cases; ulcerative, 21 cases; and fibroid, 32 cases.

Prognosis

The prognosis of genital tuberculosis does not depend entirely on the prognosis of the associated pulmonary lesion, as the authors discovered by comparing their series of cases with a comparable series of cases of pulmonary tuberculosis without genital involvement. In fact, the presence of genital tuberculosis adds considerably to the gravity of the general disease and shortens the life expectancy. At the end of a one- to eleven-year period of observation, only 34 per cent of the authors' patients were alive.

Treatment

The surgical treatment recommended varies from a careful resection of the infected focus to the complete removal of the seminal tract. The immediate mortality rate of radical surgical management, the persistent draining sinuses that are frequent sequelae of such intervention and the false rationale of removing a single focus and leaving the primarily infected prostate, have placed this form of therapy in general disrepute among phthisiologists and urologists versed in the management of tuberculosis.

The beneficial effect of ultra-violet therapy in extrapulmonary tuberculosis has been well known for many years. It is logical to choose a form of therapy which will lend itself to sharp localization to the desired areas, that is, the prostate, the seminal vesicles and the epididymes, thus producing the maximum local effect without doing any general harm. Irradiation of the epididymis alone has been common practice among the men who advocate this form of physical therapy for genital tuberculosis. It is the authors' belief that if radiation were given with equal intensity to the prostate and seminal vesicles, the most frequent primary seat of tuberculous infection in the genital tract, the result would be more certain and more rapid and reactivation would be less likely to occur.

The authors describe at some length their method of applying light therapy by means of the cold quartz lamp and report encouraging results in the treatment of the catarrhal and ulcerative types. — Reprinted from ***Tuberculosis Abstracts*** (January, 1940).

CORRESPONDENCE

HEALTH SERVICE, INCORPORATED

To the Editor: In Boston we are soon to practice medicine in competition with a lay organization known as Health Service, Incorporated, which hires as employees the Medical and Surgical Associates. Health Service, Incorporated, has already begun to solicit various groups to persuade them to allow the Medical and Surgical Associates to give them medical care. As a practitioner of medicine cannot ethically solicit patients it seems unfair for this lay organization to do so.

This is undoubtedly undermining one of the corner stones of medical ethics which has helped to keep American medicine an honored profession in the past. I believe this situation deserves a protest.

DAVID W. SHERWOOD, M.D.

66 Commonwealth Avenue,
Boston.

NOTICES

BOSTON DISPENSARY

The annual meeting and banquet of the medical staff of the Boston Dispensary will be held at the Boston City Club, 14 Somerset Street, on Tuesday evening, January 23, at 6:30.

JOINT MEETING

The Boston Tuberculosis Association, the Southern Middlesex Health Association and the Trudeau Society of Boston are holding a joint meeting on Thursday, January 25, at the University Club, 40 Trinity Place, Boston.

The Boston Tuberculosis and Southern Middlesex Health associations will have their business meetings with election of officers at 4:30 and 5 p.m., followed by a dinner at 6 p.m. which will be attended by members of the three organizations. Dr. Edward G. Huber will speak on "Tuberculosis as a Future Public-Health Problem."

At 8:15 p.m., Dr. Chevalier L. Jackson, of Philadelphia, will address the Trudeau Society on "The Role of Bronchoscopy in the Diagnosis and Treatment of Thoracic Disease." Discussion will be opened by Drs. Edward B. Benedict and Reeve H. Betts.

Physicians are cordially invited to attend.

MOSES J. STONE, M.D., *Secretary,*
Trudeau Society.

PETER BENT BRIGHAM HOSPITAL

A joint medical and surgical clinic at the Peter Bent Brigham Hospital will be held on Wednesday, January 24, from 2 to 4 p.m. Drs. John Romano and Elliott C. Cutler will speak on "Fits." A clinicopathological confer-

ence conducted by Dr. Elliott C. Cutler will take place from 4 to 5 p.m.

On Thursday, January 25, from 8:30 to 9:00 a.m. there will be at the Peter Bent Brigham Hospital, a combined clinic, conducted by Dr. Elliott C. Cutler, of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital.

Physicians and students are cordially invited to attend.

BOSTON DOCTORS' SYMPHONY ORCHESTRA

The Boston Doctors' Symphony Orchestra will rehearse under Alexander Theide, former concert-master with the Cleveland Symphony Orchestra and the Philadelphia Symphony Orchestra, every Thursday at 8:30 p.m., in Studio A, Station WMEX, 70 Brookline Avenue, Boston. Those interested in becoming members should communicate with Dr. Julius Loman, Pelham Hall Hotel, Brookline (BEA 2430).

MASSACHUSETTS GENERAL HOSPITAL

A meeting of the Hospital Research Council will be held in the Ether Dome of the Massachusetts General Hospital, on Tuesday, January 30, at 5:00 p.m.

PROGRAM

Studies on the Peripheral Circulation with the Rein Thermostromuhr. Dr. R. R. Linton.

Circulating Thyroglobulin in Normal Individuals and in Those with Thyroid Disease. Dr. J. Lerman.

Antiphagocytic Property of Human Serum. Dr. C. Lyons.

HENRY K. BEECHER, M.D., *Secretary.*

SUFFOLK DISTRICT MEDICAL SOCIETY

There will be a meeting of the Suffolk District Medical Society at the Boston Medical Library, 8 Fenway, on Wednesday evening, January 31, at 8:15.

PROGRAM

Certain Features of the Water and Salt Exchange. Dr. James L. Gamble.

Variability of the Clinical and Hemolytical Manifestations of Leukemia in Childhood. Dr. Louis K. Diamond.

Blood Ascorbic Acid Concentrations in Terms of Plasma, Red Cells and White Cells. Dr. Allan M. Butler.

The Criteria for Ligation of the Patent Ductus Arteriosus in the Light of the First One and a Half Years' Experience. Drs. John P. Hubbard and Robert E. Gross.

MILTON H. CLIFFORD, M.D., *Secretary.*

JOSEPH H. PRATT DIAGNOSTIC HOSPITAL

The following talks will be given in the auditorium of the Joseph H. Pratt Diagnostic Hospital during the week of February 4:

Monday, February 5, at 4:30 p.m. Cancer of the Stomach. Dr. George Pack, of the Memorial Hospital, New York City.

Thursday, February 8, at 4:30 p.m. Tumors of the Bone. Dr. Bradley Coley, of the Memorial Hospital, New York City. Discussion by Drs. Channing C. Simmons and Howard M. Clute. Reticulum-cell Sarcoma of Bone. Dr. Channing C. Simmons.

Physicians are cordially invited to attend these lectures.

ARLINGTON AND BELMONT MEDICAL CLUBS

A combined meeting of the Arlington and Belmont medical clubs will be held at Ring Sanatorium and Hospital, on Friday evening, January 26, at 8:15.

A report on "Mental Problems of Mid-Life: A study of one hundred cases at the Ring Sanatorium and Hospital" will be given by Drs. Curtis T. Prout and Albert U. Bourcier. Discussion by Drs. Ezekiel Pratt and Frank J. Fleming will follow.

MICHAEL F. NIGRO, M.D., *Secretary,*
Arlington Doctors' Club.

BENJAMIN SPRITZ, M.D., *Secretary,*
Belmont Medical Club.

MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

In celebration of its fiftieth anniversary the Massachusetts Public Health Association is holding a dinner at the Parker House, Boston, on Saturday evening, January 27, at 7:00. Dr. Charles-Edward A. Winslow, School of Medicine, Yale University, will be the guest speaker. His subject will be "A Half Century of Public Health."

Physicians are cordially invited to attend (dress optional). Tickets, at two dollars apiece, can be obtained by applying to the secretary, G. Donald Buckner, 69 Coolidge Avenue, Needham, Massachusetts.

MASSACHUSETTS PSYCHIATRIC SOCIETY

The next meeting of the Massachusetts Psychiatric Society will be held at the Boston Psychopathic Hospital on Thursday evening, January 25, at 8:00.

PROGRAM

Infectious Processes in the Causation of Mental Deficiency. Dr. Clemens E. Benda.

Physiologic Aspects of Schizophrenic Withdrawal. Drs. A. Angyal, H. Freeman and R. G. Hoskins.

W. FRANKLIN WOOD, M.D., *Secretary.*

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Beth Israel Hospital, Monday, January 29, at 8:15 p.m.

PROGRAM

Logarithmic Recording: A standardized method for studying heart sounds. Drs. Joseph E. F. Riseman and M. Rappaport.

The Mechanism and Significance of the Action of Paredrine on the Veins. Dr. Arnold Iglauer.

The Degree of Latent Edema After Recovery from Congestive Failure. Dr. Mark D. Altschule.

Clinical and Pharmacological Observations in Paroxysmal Ventricular Tachycardia. Dr. Harry Linenthal.

The Significance of Deep S_2 in the Electrocardiogram. Drs. Louis Wolff and Max J. Klainer.

Observations on the Cardiac Complications in Patients Dying in Shock. Dr. Paul M. Zoll.

The Effect of Nitroglycerin and Theobromine Sodium Acetate on the Electrocardiogram During Exertion in Patients with Angina Pectoris. Dr. A. Stone Freedberg.

The Degree of Myocardial Fibrosis as Estimated Chemically by the Collagen Content: Results and interpretations. Drs. Dorothy R. Gilligan and Herrman L. Blumgart.

Interested physicians and medical students are invited to attend.

EDWARD F. BLAND, M.D., *Secretary.*

NEW ENGLAND SOCIETY OF PHYSICAL MEDICINE

The next meeting of the New England Society of Physical Medicine will be held at the Hotel Kenmore, Boston, on Wednesday evening, January 24. The council will meet at 6:00; there will be an informal dinner at 6:30.

Dr. A. Philip Mooradian, of New York City, will speak on the subject, "Comparative Physics of Long-Wave and Short-Wave Diathermy Generators." A question period will follow.

All members of the medical profession are cordially invited to attend.

WILLIAM D. McFEE, M.D., *Secretary.*

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING SUNDAY, JANUARY 21

SUNDAY, JANUARY 21

4 p.m. What about Sulfanilamide? Dr. Chester S. Keefer. Free public lecture. Harvard Medical School, amphitheater of Building D.

MONDAY, JANUARY 22

American Academy of Orthopaedic Surgeons. Hotel Statler, Boston.

*12:15–1:15 p.m. Clinicopathological conference. Dr. S. Burt Wolbach, Peter Bent Brigham Hospital amphitheater.

TUESDAY, JANUARY 23

American Academy of Orthopaedic Surgeons. Hotel Statler, Boston.

*9–10 a.m. X-Ray Clinic: Presentation of Cases. Dr. A. Ettinger. Joseph H. Pratt Diagnostic Hospital.

*10 a.m.–12:30 p.m. Boston Dispensary tumor clinic.

*12:15–1:15 p.m. X-ray conference. Dr. Merrill C. Sosman. Peter Bent Brigham Hospital amphitheater.

6:30 p.m. Medical staff of Boston Dispensary. Boston City Club.

8:15 p.m. Boston Lying-in Hospital, Journal Club.

WEDNESDAY, JANUARY 24

American Academy of Orthopaedic Surgeons. Hotel Statler, Boston.

*9–10 a.m. Hospital case presentation. Dr. S. J. Thannhauser. Joseph H. Pratt Diagnostic Hospital.

*12 m. Clinicopathological conference. Children's Hospital amphitheater.

*2–4 p.m. Joint medical and surgical clinic. Peter Bent Brigham Hospital.

*6 p.m. New England Society of Physical Medicine. Hotel Kenmore, Boston.

THURSDAY, JANUARY 25

American Academy of Orthopaedic Surgeons. Hotel Statler, Boston.

*8:30–9:30 a.m. Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital, at the Peter Bent Brigham Hospital.

*9–10 a.m. Otolaryngology Clinic: Presentation of cases. Dr. P. E. Meltzer. Joseph H. Pratt Diagnostic Hospital.

*4:30 p.m. Boston Tuberculosis Association. University Club, 40 Trinity Place, Boston.

*5 p.m. Southern Middlesex Health Association. University Club, 40 Trinity Place, Boston.

8 p.m. Massachusetts Psychiatric Society. Boston Psychopathic Hospital.

*8:15 p.m. Trudeau Society of Boston. University Club, 40 Trinity Place, Boston.

FRIDAY, JANUARY 26

*9–10 a.m. Peritoneoscopy in Diagnosis of Abdominal Tumors. Dr. W. E. Garrey. Joseph H. Pratt Diagnostic Hospital.

*10 a.m.–12:30 p.m. Boston Dispensary tumor clinic.

SATURDAY, JANUARY 27

*9–10 a.m. Hospital case presentation. Dr. S. J. Thannhauser. Joseph H. Pratt Diagnostic Hospital.

*10 a.m.–12 m. Medical staff rounds of the Peter Bent Brigham Hospital. †Conducted by Dr. Soma Weiss.

*7 p.m. Massachusetts Public Health Association. Parker House, Boston.

*Open to the medical profession.

JANUARY 19 — Staff meeting. United States Marine Hospital. Page 39, issue of January 4.

JANUARY 21 — Free public lecture. Harvard Medical School. Page 1042, issue of December 28.

JANUARY 21 — Salem Hospital public lecture. Page 1042, issue of December 28.

JANUARY 21 — Free public lecture. Quincy City Hospital. Page 77, issue of January 11.

JANUARY 22–25 — American Academy of Orthopaedic Surgeons. Hotel Statler, Boston.

JANUARY 23 — Boston Lying-in Hospital. Page 77, issue of January 11.

JANUARY 23 — Medical Staff, Boston Dispensary. Page 121.

JANUARY 24 — Joint medical and surgical clinic. Peter Bent Brigham Hospital. Page 121.

JANUARY 24 — New England Society of Physical Medicine. Notice above.

JANUARY 25 — Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital. Page 121.

JANUARY 25 — Joint meeting, Boston Tuberculosis Association, the Southern Middlesex Health Association and the Trudeau Society of Boston. Page 121.

JANUARY 25 — Massachusetts Psychiatric Society. Page 122.

JANUARY 26 — Arlington and Belmont medical clubs. Page 122.

JANUARY 27 — Massachusetts Public Health Association. Page 122.

JANUARY 29 — New England Heart Association. Page 122.

JANUARY 30 — Massachusetts General Hospital. Page 122.

FEBRUARY 5 — Cancer of the Stomach. Dr. George Pack. Joseph H. Pratt Diagnostic Hospital. Page 122.

FEBRUARY 8 — Tumors of the Bone. Dr. Bradley Coley. Joseph H. Pratt Diagnostic Hospital. Page 122.

FEBRUARY 8 — Pentucket Association of Physicians. 8:30 p.m., Hotel Bartlett, Haverhill.

FEBRUARY 11–14 — International College of Surgeons. Page 759, issue of November 9.

FEBRUARY 22–24 — American Orthopsychiatric Association. Page 957, issue of December 14.

MARCH 2, JUNE 8 and 10 — American Board of Ophthalmology. Page 719, issue of November 2.

MARCH 7–9 — The New England Hospital Association. Hotel Statler, Boston.

APRIL 24–26 — Scientific Session. Academy of Physical Medicine. Hotel John Marshall, Richmond, Virginia.

MAY 10–18 — American Scientific Congress. Page 1043, issue of December 28.

MAY 14 — Pharmacopoeial Convention. Page 894, issue of May 25.

JUNE 7–9 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH

FEBRUARY 14 — Cough, Sputum, Hemoptysis — How shall they be investigated? Dr. Reeve H. Betts. Essex Sanatorium, Middleton.

MARCH 6 — Experimental and Clinical Consideration of Sulfanilamide Treatment of Hemolytic Streptococcal Infections. Dr. Champ Lyons. Lynn Hospital, Lynn.

APRIL 3 — Addison Gilbert Hospital, Gloucester.

MAY 8 — Annual meeting. Salem Country Club, Peabody.

HAMPDEN

JANUARY 23 — Page 77, issue of January 11.

HAMPSHIRE

MARCH 13.

MAY 8.

Meetings are held at 11:30 a.m. at the Cooley Dickinson Hospital, Northampton.

MIDDLESEX EAST

MARCH 20.

MAY 15.

Meetings are held at 12:15 p.m. at the Unicorn Country Club, Stoneham.

MIDDLESEX NORTH

JANUARY 31.
APRIL 24.
JULY 31.
OCTOBER 30.

NORFOLK

JANUARY 30 — Page 77, issue of January 11.

NORFOLK SOUTH

FEBRUARY 1.
MARCH 7.
APRIL 4.
MAY 2.

All meetings, with the exception of one which is usually held at the Quincy City Hospital, are held at the Norfolk County Hospital in South Braintree, at 12 o'clock noon.

PLYMOUTH

MARCH 21 — Goddard Hospital, Brockton.
APRIL 18 — State Farm.
MAY 16 — Lakeville Sanatorium, Lakeville.

SUFFOLK

JANUARY 31 — Scientific meeting. Page 122.

MARCH 27 — Scientific meeting. Symposium on Ulcerative Colitis and Diarrheas. Under the direction of Dr. Chester M. Jones.

APRIL 24 — Annual meeting in conjunction with the Boston Medical Library. Election of officers. Program and speakers to be announced later.

WORCESTER

FEBRUARY 14 — Worcester State Hospital.
MARCH 13 — Worcester Memorial Hospital.
APRIL 10 — Worcester Hahnemann Hospital.
MAY 8 — Worcester Country Club.

Each meeting begins with a dinner at 6:30 p.m. and is followed by a business and scientific meeting.

BOOKS RECEIVED FOR REVIEW

Hospital for the Ruptured and Crippled: A historical sketch written on the occasion of the seventy-fifth anniversary of the hospital. Fenwick Beekman. 157 pp. New York: Ruptured and Crippled Hospital, 1939. $3.00.

Minor Mental Maladjustments in Normal People: Based on original autobiographies of personality maladjustments. J. E. Wallace Wallin. 298 pp. Durham: Duke University Press, 1939. $3.00.

Climate and Evolution. William D. Matthew. Second edition. 223 pp. New York: The New York Academy of Sciences, 1939. $2.00.

The Diagnosis and Treatment of Diseases of the Esophagus. Porter P. Vinson. 224 pp. Springfield, Illinois, and Baltimore: Charles C Thomas, 1939. $4.00.

The New International Clinics: Original contributions, clinics and evaluated reviews of current advances in the medical arts. Edited by George M. Piersol. Vol. 4, N. S. 2. 339 pp. Philadelphia, Montreal, and New York: J. B. Lippincott Co., 1939. $3.00.

Speech Correction: Principles and methods. C. Van Riper. 434 pp. New York: Prentice-Hall, Inc., 1939. $2.50.

Harvey Cushing's Seventieth Birthday Party, April 8, 1939: Speeches, letters and tributes. Published for the Harvey Cushing Society. 146 pp. Springfield, Illinois: Charles C Thomas, 1939. $3.00.

Biological Products. Louis Gershenfeld. 236 pp. New York: Romaine Pierson Publishers, Inc., 1939. $4.00.

Population, Race and Eugenics. Morris Siegel. 206 pp. Hamilton, Ontario: published by the author, 1939. $3.00.

One Way of Living. James Bridie. 299 pp. London: Constable & Co., Ltd., 1939. 8s. 6d.

Love Problems of Adolescence. Oliver M. Butterfield. 212 pp. New York: Emerson Books, Inc., 1939. $2.25.

BOOK REVIEWS

Thus We Are Men. Walter Langdon-Brown. 344 pp. New York: Longmans, Green & Co., 1939. $3.50.

The author has collected papers from many sources and reproduced them in book form. He was formerly the professor of physic at the University of Cambridge and, for many years, physician to St. Bartholomew's Hospital. Many of these papers have appeared in medical journals. They deal with a wide variety of topics, mostly of a historical or philosophical nature. There are two short interesting biographies, one of Robert Bridges and the other of William Osler. Other distinctly medical topics deal with the background of Harvey, the plague of England and the evolution of death. All are written in a pleasant, easy style. The wide learning of the author is everywhere in evidence. He does not write in the modern popular manner, but nevertheless these essays are extremely valuable for the physician and the more informed of the lay public. The high literary standards of the English physician are upheld by this book.

The New International Clinics: Original contributions, clinics and evaluated reviews of current advances in the medical arts. Edited by George M. Piersol. Vol. 3, N. S. 2. 332 pp. Philadelphia, Montreal and New York: J. B. Lippincott Co., 1939. $3.00.

Leading off with an excellent summary of the salient facts regarding peripheral vascular disease, this volume continues with a carefully chosen group of articles too numerous to mention individually. The subjects covered are diverse, and the manner of presentation is of high caliber. Some of the articles are eminently practical, such as one concerning the surgical treatment of hemorrhoids; others, such as one discussing studies on leukemia, delve into the experimental aspects.

Sleep and Wakefulness: As alternating phases in the cycle of existence. Nathaniel Kleitman. 638 pp. Chicago: The University of Chicago Press, 1939. $5.00.

The author of this book, now associate professor of physiology at the University of Chicago, offers students a *stimulating and critical account of sleep and wakefulness.* The discussion is chiefly limited to the contributions which have been made since the appearance in 1912 of Pierson's book, *Le Probleme Physiologique du Sommeil.* The author's own interest and work in this field of investigation date from 1921. He has been led to evolve what he terms the evolutionary theory of sleep and wakefulness, a concept which involves the organism as a whole and is in contrast to the previously held theories, such as the neural, the humoral or the combination of both, the neural and the humoral. The book is divided as follows: Part I, "Functional Differences between Wakefulness and Sleep"; Part II, "The Course of Events during the Sleep Phase of the Cycle"; Part III, "Periodic Characteristics of Both Phases of the Cycle"; Part IV, "Interference with the Sleep-Wakefulness Cycle"; Part V, "Spontaneous Changes in the Sleep-Wakefulness Cycle"; Part VI, "Means of Influencing the Sleep-Wakefulness Cycle"; Part VII, "States Resembling Sleep"; Part VIII, "Theories of Sleep."

There is an excellent bibliography which covers 72 pages and contains 1434 references. Author and subject indices follow.

This book is a valuable contribution to the subject, and students of biology will read it with much profit.